approach

JUNE 1972 THE NAVAL AVIATION SAFETY REVIEW

NAVY

Aviate, Navigate, Communicate

1. ACCIDENT PREVENTION
2. ACCIDENTS, AIR--Causes
3. FLYING SAFETY

illus 1-3

. . . the pilot abruptly broke off a radio transmission in mid-sentence. Simultaneously, his aircraft was observed to disappear from the radar scope in a steep descent.

DAY and night instrument approaches, under a wide variety of weather conditions, are a normal and necessary part of naval flight operations. Most of the approaches are completed safely and routinely, but occasionally one ends in a tragic accident.

Two A-7Es were enroute to their homebase after a 2-day RON. After a mid-Continent fuel stop, the two *Corsair IIs* took off late in the afternoon on the final leg to destination. ETA at homebase was well after dark.

On this leg, the flight encountered IFR conditions and the wingman experienced vertigo. However, after emerging from the weather, the vertigo disappeared within minutes.

During the flight, the leader contacted Metro on two occasions and determined that weather at homebase was more or less as forecast, i.e., ceiling 500 foot broken, 1000 overcast, and visibility 2 miles in light rain and fog. The leader advised his wingman that individual precision approaches would be requested at homebase.

About 100 miles out, the section was separated for individual enroute descents and precision finals. The leader, possibly concerned about his wingman's vertigo earlier in the flight, directed the wingman to make the first approach.

During his descent from altitude, the flight leader entered the clouds at 4000 feet. He was given a radar vector and leveled at 3000 feet.

Continued

At about 20 miles, he was handed over to GCA, cleared to 1700 feet, and turned from a heading of 150 degrees to 100. At the time he was solid IFR and experiencing considerable turbulence.

About 3 minutes later – within a period of 15 seconds – he was given a descent to 1200 feet, advised to complete his landing checklist, and handed off to the final controller (who immediately asked for a gear check). Within the next 45 seconds, he was given a heading change, missed approach instructions, and lost communications procedures.

Fifteen seconds later, the pilot abruptly broke off a radio transmission in mid-sentence. Simultaneously, his aircraft was observed by the final controller to disappear from the radar scope in a steep descent. The A-7 had crashed, fatally injuring the pilot.

The most probable reason for the crash was a stall from which the pilot was unable to recover. This, more than likely, resulted from the pilot's failure to reapply power after transition to the landing configuration and deceleration to final approach speed.

According to the aircraft mishap board, the pilot was recognized by contemporaries and superiors alike as a truly outstanding naval aviator. He knew his aircraft well. As one of the most conscientious flight leaders in the squadron, he was most interested in a professionally briefed and well-executed flight. He always took time for a proper debrief. His commanding officer said of him:

"He was an outstanding aviator. He had accumulated over 2500 hours, with over 500 hours in A-7 aircraft. Additionally, he distinguished himself as an exceptional combat aviator during two deployments to the Seventh Fleet. His approach to flying was most professional in all respects.

"Although he exhibited an aggressiveness and can-do spirit, he always tempered these attitudes with mature judgment and complete adherence to standard procedures and established policies. He was one of the most competent aviators with whom I have had the pleasure of serving."

Accordingly, both the aircraft mishap board and the commanding officer initially found it inconceivable that the pilot allowed the aircraft to stall. Nevertheless, after an exhaustive investigation which included actual and simulated flight tests (using an A-7E and a weapon systems trainer), an unintentional stall seemed to be the only logical explanation.

This accident, needless to say, caused a lot of soul searching among the squadron pilots, the aircraft mishap board and endorsers to the mishap report. There is little doubt as to *how* the accident occurred but the question of *why* is less clear. Sure, it's easy to say that the pilot

failed to add power after decelerating to approach speed, but *why*?

Fatigue, lack of proficiency, and get-home-itis were considered as possible predisposing factors, but were rejected. The possibility of distraction was also considered. The pilot is known to have been concerned about his wingman (because of his earlier bout with vertigo). He is also known to have been concerned about the operation of his own TACAN, knowing that he would need it in good working order in the event of a missed approach.

In addition, it is possible that an aircraft malfunction or some other event may have occurred to distract him, e.g., a warning light. However, careful investigation failed to produce any evidence to substantiate this theory.

The main thrust of the aircraft mishap board's investigation and analysis related to weather and GCA conditions. Gusty (turbulent) conditions existed during the approach. The board noted that the pilot had been in the clear above 4000 feet and had to transition from VFR flight to full instrument conditions and a demanding workload, while coping with the turbulence.

That is, according to the board, "the pilot attempted to descend, reduce speed, lower his landing gear and flaps, make a heading change, acknowledge that he was at 6 nautical miles, listen to and acknowledge the missed approach and lost communications procedures – all in 1 minute and 17 seconds. The radio transmissions alone required 60-65 seconds – approximately 85 percent of the 1 minute and 17 seconds."

Nevertheless, the board concluded that the radar controllers were correct in all their procedures prior to

the accident. This view was confirmed by the naval air station commanding officer, who stated in part:

"The GCA approach was in accordance with approved standards. It was identical to the one given to the pilot's wingman who landed just prior to the accident, except that radar handoff from approach control was at 20 miles whereas his wingman's handoff was at 16 miles. A review of the tape by five chief aircontrolmen (with a total of 73 years combined control experience) resulted in each of them stating that the tempo of control instructions and radio transmissions were no different than thousands of approaches they have made, listened to, and controlled.

So there you have it. Neither pilot preparation for flight, nor approach procedures in effect at the time of the accident can be faulted when measured against approved and accepted standards. Yet, the fact remains, a highly experienced pilot apparently became momentarily overloaded at a critical time. The reason for this is a moot point but, logically, all practical steps should be taken to guard against a recurrence of this type accident. Specifically, it is recommended that:

• Stations and tenant activities review radar approach procedures in effect at their locations with a view toward detecting procedures and conditions which might tend to overload a pilot during an approach. Attention should be given to the type aircraft controlled and, where indicated, consideration should be given to:

(1) A longer final approach, consistent with fuel requirements.

(2) Earlier handoff to the final controller to give pilots more time to receive, understand, and acknowledge comm/missed approach instructions.

(3) Standardized lost comm/missed approach instructions similar to non-precision approaches.

(4) Earlier transition to landing configuration.

(5) Higher approach speeds (at pilot's option) during adverse weather conditions such as turbulence.

• Pilots and controllers guard against complacency. Nowadays, IFR flight is the rule rather than the exception. As a result, numerous IFR radar approaches are flown in VMC (visual meterological conditions). Obviously, there is a potential for both pilots and controllers to become complacent under such conditions. However, it is emphasized that there was no evidence of either pilot or controller complacency in the accident discussed. Nevertheless, the potential exists, and care should be taken to ensure that IFR approaches in VMC are not controlled or executed in such a manner that bad habits are developed or complacency allowed to creep in.

• Pilots must fly the aircraft first. Each approach is unique and possesses its individual problems; but the pilot should not forget that control of the aircraft is solely up to him. In appropriate circumstances, he should consider transitions above a cloud layer, early transition, or a change in flight clearance. Finally, if in spite of all his planning, he finds he is becoming overloaded with tasks, he should follow the old aviation maxim and do first things first, i.e.:

Aviate, Navigate, Communicate

1. THUNDERSTORMS
2. ALL WEATHER FLYING
3. FLYING SAFETY

Warning!

SEVERE WEATHER AHEAD.

illus 4–6

"I NOTICED a very dark thunderstorm line about 70 miles ahead. It was about 100 miles wide and extended up to 40 or 50 thousand feet."

These are the words a TA-4J pilot used to describe the beginning of an encounter with a severe thunderstorm, while flying at FL 310, Mach .78. He continues:

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"The majority of the line was to the right of our course, and since I could see the western end of the line, I requested a deviation to a heading of 270 to circumnavigate the line. Center approved.

"Immediately thereafter, I heard another aircraft call clear of the weather. I called this aircraft and asked where he had passed the weather. He replied that there was a hole about 30 miles south of the TACAN station which we were both using. I checked my position and heading and determined that we should hit the hole without any further heading change.

"A few minutes later we entered stratus clouds on a heading of 270 degrees. I could see that the weather 3 to 5 miles off to the right was VFR. But, as the thunderstorm line was oriented East-West, *I decided it was not necessary to stay VFR since this was an instrument training flight, and the practice would be good for the student.*

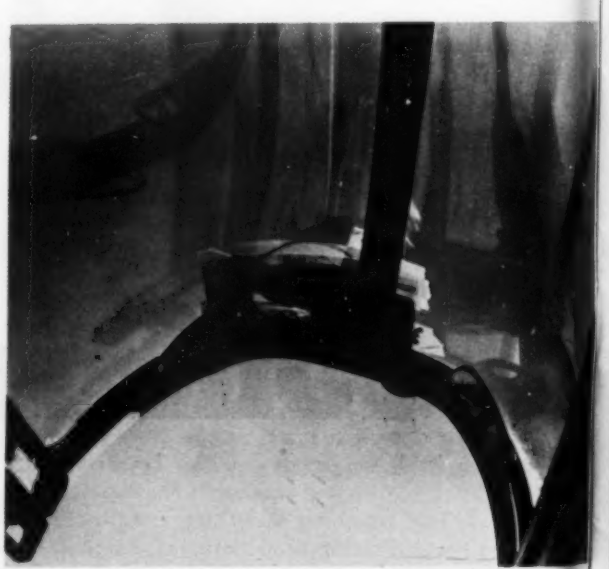
"A few minutes later, we encountered light rain, very light hail and . . . simultaneously, a horizontal crack appeared in the bullet-proof windscreen.

"I immediately took control of the aircraft, slowed to 250 knots and turned to 240 degrees. Within 15 seconds we encountered *extremely heavy hail and severe turbulence*. More cracks appeared in the windscreen and the student (in the front cockpit) exclaimed, 'It's going to go!'

"About this time a hailstone knocked a 6-inch hole in the forward canopy, just to the left of the clock/wet compass."

The pilot decided he had had enough. He turned to a heading of 180 degrees, squawked emergency on the IFF, and commenced a descent. Breaking clear of the storm, he diverted to a nearby Air Force Base and made an uneventful landing. Neither pilot was injured, but the aircraft was damaged substantially (see photos).

This pilot escaped with a damaged aircraft and a new crop of gray hair. He may have been lucky, at that. NAVSAFECEN records show that thunderstorms have



Thunder is good, thunder is impressive; but it is lightning that does the work.

Mark Twain

been responsible for the loss of a number of lives – and even more aircraft.

Thunderstorm Hazards

Individual thunderstorm cells are rarely larger than 10 miles in diameter, and their life cycle is normally between 20 minutes and ½ hour in duration. However, it is very common for thunderstorms to develop in clusters of two or more. Clusters, with individual thunderstorms at various stages of development, sometimes attain diameters in excess of a hundred miles and last for 6 hours or more.

Thunderstorms are almost always attended by severe or extreme turbulence, icing, lightning, thunder, precipitation, and gusty surface winds. The more severe ones produce hail and sometimes tornadoes.

Hail competes with turbulence for first place as being the greatest hazard to aircraft. Most, and perhaps all, thunderstorms have hail in the interior of the cumulonimbus cloud at some stage. In a large percentage of the cases, the hail melts before reaching the ground, but this does not lessen its danger to the pilot who encounters it aloft.

Usually, hail is produced during the mature stage of the thunderstorm's life span and is most frequently encountered at levels between 10,000 and 30,000 feet, but the frequency of large hail decreases quite markedly above 35,000 feet. Hailstones with diameters up to 5 inches have been reported at 29,500 feet. Hail may be found at any level within a thunderstorm and, on occasion, may be encountered in clear air outside of the storm cloud. Hailstones may be thrown upward and outward from the cloud for as much as 5 miles under an innocent-appearing anvil of cirrus clouds.

Turbulence. All thunderstorms are turbulent, and some are potentially destructive to aircraft. Almost any thunderstorm contains the potential to produce "severe" turbulence, and the typical large ones may produce turbulence classified as "extreme." Those which create the most severe turbulence are the "hail producers."

Continued

While considerable turbulence may be found anywhere in the thunderstorm, there is less chance for severe or extreme turbulence in the lower levels.

In addition to the possibility of structural damage to aircraft, there exists the possibility of loss of control because of disorientation or improper manipulation of flight controls. Another factor which accounts for many accidents is the gusty surface winds produced by thunderstorms. This, of course, is primarily a hazard during landing or takeoff.

Lightning. Electricity generated by a thunderstorm can offer a real hazard to aircraft from the standpoint of safety. There has been at least one accident involving a transport type aircraft where it is suspected that lightning ignited fuel vapors causing destruction of the aircraft. In any case, lightning is annoying to flight crews; it may cause momentary flash-blindness, and will often damage aircraft surfaces and electrical components.

Thunderstorm Precautions

The number one rule is to avoid thunderstorms *if at all possible.* Make maximum use of *preflight weather briefings* and *Metro* information while inflight. If your aircraft does not have radar, it is best to *remain VFR* while operating in an area where thunderstorms are present. If IFR flight is attempted, there exists the possibility that you will unknowingly fly into an embedded thunderstorm.

If, in spite of all precautions, flight in a thunderstorm cannot be avoided:

(1) Secure all loose objects in the aircraft and ensure that all hands are securely strapped in.

(2) Illuminate cockpit lighting to highest intensity as a protection against momentary blindness from lightning flashes.

(3) Establish penetration altitude. Avoid altitudes from the freezing level upward to -10°C (roughly 5000 feet above the freezing level). This usually is the most severe region of the thunderstorm. The "softest" altitude is usually between 4000 and 6000 feet. *Four thousand feet above the highest terrain should be the minimum penetration altitude.*

(4) Reduce airspeed to NATOPS recommended rough air penetration speeds. Set power to maintain the desired speed before entering the storm and keep constant power settings in the storm.

(5) Fly attitude. Altitude and airspeed will vary considerably during turbulence, but better control can be maintained with minimum hazard to the airframe by flying attitude. If the aircraft is equipped with an autopilot, *disengage the altitude hold feature during thunderstorm penetration.*

(6) Pick a heading that will take you through the storm in minimum time and hold it.

Good Luck.

You Might Be Surprised

TOWER chiefs, take heed! How many pilots flying out of your airport are completely familiar with the airport and local flying rules? Did I hear an answer? . . . Oh! the *squadrons* are responsible for area familiarization, are they? Well, that may be true; however, think how much safer your airport would be if every pilot actually knew what you *think* he knows.

As a case in point, I offer the following: 21 local pilots were given a written, 10-question test at my NAS. The subject of the test was local procedures, positive control and basic instrument procedures at this particular airport. The results were astounding!

One question (obviously the easiest) was missed by only 8 of the 21. All the other questions were missed by at least 50 percent of the pilots. One question was missed by 18 pilots. It should be pointed out that these were not trick questions on "off the wall" topics, but valid, important issues.

Is there a squadron safety officer reading this? Well, sir, before you finish this magazine, I strongly recommend that you call Base Ops and ask to speak to the tower chief. Don't wait for one of your pilots to become a statistic. Do it now.

Tower chiefs – haven't you heard from the squadron safety officer yet? Don't be proud; call him. Get together and talk. Set up briefings and discuss problem areas. What was that? You don't have any problem areas? Well, *prove it. Make up a test.* You might be surprised.

Towermouse

This story, if it were not true, would be amusing. However, it is being printed to salute everyone who has ever cussed, strained and moaned when time came to open a balky hangar door.

Hey, Joe, Which Way?

EARLY one evening a helicopter was parked in the hangar with the horizontal stabilizer protruding outside. One side of the hangar door was open and the other side partially open.

The night crew was directed to move the aircraft from the hangar to the flight line. To do so, the partially open door had to be opened all the way – so the rotor blades would clear.

A crew was formed to move the helicopter. One of the wingwalkers later stated that he accidentally hit the door CLOSE switch. The result was as you would suspect. The door struck the leading edge of the horizontal stabilizer. *But wait! There's more.*

The investigation found that two control boxes used for moving the doors were incorrectly marked. The box marked East controlled the West door and vice versa. Also the hatch in the East door had a faulty microswitch, i.e. when the hatch was open and the box marked West activated, the hangar door would open *or close! Don't go away. There's still more.*

When activating either of the control boxes, in OPEN or CLOSE mode, it was anyone's guess as to which door would move – due to a short in both boxes. If that wasn't confusing enough (would you believe) the instructions printed on the control boxes were vague. The 3-position switch was mounted in the box below the instructions: OPEN on the left and CLOSE on the right. In neutral, the arm of the switch was at the 9-o'clock/3-o'clock position. To open the door, would you rotate the arm clockwise to OPEN or counterclockwise toward CLOSE? The way it was rigged, the correct way to open the door was to move the switch counterclockwise away from OPEN toward CLOSE.

If you're confused trying to follow the narrative, imagine the maintenance troops!

Since the incident report did not address the problem, it is not known how long this screwball lashup had existed. You can bet there was a heap of scurrying around to correct the defects. ◄

1 SEARCH AND RESCUE

SEARCH & RESCUE

illus 8-10

SAR is a clarion call to action. Someone is in trouble and you have the ready duty. Go!

When the Klaxon sounds it means no wheel spinning, no lost motion, and no last minute chores. You react, and you react quickly. *Automatically.*

Your actions are preplanned. Your concentration is studied. The steps to launch have been practiced with your crew countless times. Frequent drills have determined the exact time it will take to launch.

SAR alerts do not mean that NATOPS and common sense are to be dispensed with. Even during alert launches, you and your crew must give and receive the proper checklist replies. This includes using the proper hand signals and making the proper radio transmissions before takeoff.

Normal time to launch will vary according to the status of the duty crew. Obviously a helicopter on the flight deck in Condition 1 (crew aboard and checks completed up to a point) can be launched very quickly. Standby crews for fixed-wing or rotary-wing aircraft ashore may be allowed as much as an hour or more to launch.

Once airborne, the aircraft commander must remember he is responsible for the safety of his crew and aircraft. Sometimes you may be completely frustrated when you're on the scene and can do nothing. However, when faced with this situation you can neither jeopardize a crewman nor risk your aircraft. For example, if you're attempting a helo rescue of a pilot in gale winds and high seas, it is foolhardy to put a swimmer in the water.

A decision to land the aircraft on a SAR mission frequently arises. A rule of thumb might be, if you're flying a fixed-wing SAR aircraft (HU-16), if sea conditions permit an open-sea landing and takeoff, and if there is no other help available, go ahead and land. If

there is other assistance available, don't risk an open-sea landing.

Helicopter pilots frequently have a choice of landing or hovering. Again, if the terrain permits and time can be saved, go ahead and land.

Rescue Mission

A UH-1N was launched in response to an urgent SAR call. A swimmer had incurred serious injuries. When the pilot reached the scene, the swimmer was being attended to. The horse collar was useless because of the nature of the swimmer's injuries, and the pilot decided not to use a Stokes litter because he could save time by landing on some nearby rocks. The injured man was carried to the helicopter and flown to a hospital.

After the helicopter returned to base, damage was found. The weight of the helicopter landing on an uneven surface had caused damage to the skids and cross tubes.

The CO commented:

"Willingness to take a certain amount of calculated risk to save the life of a fellow human being is common to most SAR pilots and is indeed commendable. In analyzing each situation, however, the SAR pilot must weigh the possible consequences to aircraft and crew, if conditions are such that a degree of risk is involved, against the possibility that by taking a calculated risk, and *only* by taking such a risk, the victim's life may be saved. This is a difficult choice at best, and one that must invariably be made under conditions of urgency. When faced with such a choice the SAR pilot will do well to keep two factors firmly in mind: (1) Safety of aircraft and crew is paramount, as jeopardizing either may very well result in compounding the rescue problem, and (2) the sixty-odd years of accumulated

evidence that aviation is extremely unforgiving of short cuts. The fact that this landing resulted in damage to the aircraft, damage which was not even realized until the aircraft landed back at base, suggests that the safety of crew was in fact placed in jeopardy, and needlessly, as alternatives other than a solid landing were available. In reviewing this incident for lessons learned which may be applied to future rescues, the briefings and discussions have echoed the philosophy discussed above and have generally conformed to the following outline:

- Keep your cool. *All* rescues are urgent.
- Be methodical. Fools rush in. Haste fosters panic which impairs judgment.
- No shortcuts. *Always* sign yellow sheets. *Always* use checklists.
- Expect to see blood. Don't panic at sight.
- Safety of aircrew is paramount.
- No landings in questionable terrain. If in doubt, hover and use hoist." ◄

Action Line for Safety

COMMANDER Light Attack Wing ONE message 092241Z of March, addressed to LATWING ONE units, deals cogently with a knotty problem in naval aviation – the timely updating of maintenance publications. The message states, in part:

"Aircraft accidents/incidents are often attributed, in part, to erroneous information or lack of sufficient detail in maintenance publications/directives. The goal is accident reduction by elimination of preventable accidents due to discrepant procedures.

"OPNAVINST 4790.2 assigns quality assurance certain responsibilities regarding audit and verification of maintenance procedures and directives and provides guidelines for effecting corrections or changes to publications via URs (Unsatisfactory Reports).

"Deficiencies in publications/directives discovered as a result of investigative efforts attending accidents/incidents demonstrate the need for more timely detection and correction of discrepant procedures. Verification of procedures and publications should be accomplished as a matter of routine with each employment. If questions arise as to the adequacy or correctness of procedures, immediate steps must be initiated to ensure timely and appropriate corrective action. OPNAVINST 4790.2 specifically tasks quality assurance with the responsibility for ensuring that maintenance procedures are correct and properly employed. In many instances, however, maintenance technicians actually performing repair actions are in a better position to detect procedural deficiencies than are quality assurance personnel.

"Accordingly, a maintenance 'Action Line' is hereby established to facilitate timely corrective action of discrepant procedures/publications. COMLATWING ONE will initiate appropriate action when informed of a discrepant procedure/publication via an 'Action Line' input. Items may be submitted informally via phone or simple memorandum. Inputs are encouraged directly from the technician performing aircraft maintenance. Due credit will be afforded the source and dissemination of information will be accomplished when appropriate.

"Submit items by memo to COMLATWING ONE Code 40 marked 'Action Line' or by phone inputs to COMLATWING ONE, Autovon 434-1730, Maintenance, extension 506, 507 or 508."

This innovative approach to timely updating of maintenance publications/directives expresses an attitude which might profitably be applied to other areas in the search for a mishap-free Navy. We believe it to be worthy of emulation. ◄

Safety is work that is more than opportune; it is imperative.
Victor Hugo

LET'S TALK IT UP!

By CDR C. E. Clausen, CO, VT-22

A LOT of words have been, and will continue to be, written about aviation safety – words which relate to the specifics of a situation, and sometimes even to the *why* of aircraft accidents. But, how often do you see effective communications mentioned? Very infrequently – yet communication is one of the most powerful tools of a dynamic safety program.

By effective communications, I specifically mean personal conversation – just plain, old everyday talking to one another. I don't mean merely mouthing safety slogans, rather, a pragmatic give-and-take discussion of problem areas. This can lead to other means of dissemination, such as messages, telephone calls, or written articles. The first step, though, is to talk about it. Just think of the wide spectrum of problems you have seen that could have been averted had there been a little bit of timely conversation.

First of all, communications must be effective within the chain of command. That is, a vertical flow of communications as well as a horizontal flow among your peers. It is obvious that this places immense responsibility on both the senior and junior in the situation, for there must exist a parallel in loyalty. Each has a duty to send information up and down the line. When *either* fails to keep the information flowing, we are faced with a problem area which could rapidly develop into an accident.

There is no place in aviation for the "I've got a secret" crowd. If you know of a better way to do something, or discover the old way is incorrect, let someone know. We must use every means of effective communication to pass the word on *everything* wrong and on every new and better idea or design. By so doing, we will all benefit.

In a practical sense, you can look back on your own experience and see the importance of effective communications. Remember the squadron that experienced some minor maintenance problems and failed to mention them to anyone else? It's only a matter of time until the same problems appear elsewhere, with possibly more severe consequences.

When is the last time your safety officer personally visited a sister squadron on an informal basis? How about publishing a squadron newsletter? If you do, is it sent to sister squadrons? What about a local Anymouse program? In our community there is probably an average of at least one Anymouse a day. How about a safety "happy hour" where individuals can discuss safety in an informal atmosphere as part of your next safety standdown? Athletic teams talk it up – why can't the aviation safety team?

Effective communication, simply stated, is one of the premiums directly affecting the insurance of our safety programs. Only by talking to each other and making every man a safety officer will we be able to analyze, understand, and prevent accidents before they happen.

NAVANTRACOM *Aviation Safety Bulletin*

ANYMOUSE SPECIAL

Busting Minimums Again

AN ARTICLE entitled "Busting Minimums" appeared in the October 1971 APPROACH. Emphasizing the importance of adhering to approach minimums, the article warned that we must "observe them at all times." This warning may be too general, for the series of events described in the following paragraphs present an extremis situation in which a pilot's decision to bust minimums may be justified.

A flight of three T-2 aircraft was scheduled for an early morning departure from Homebase. While filing for Fuelstop airfield, the pilots were informed that Fuelstop was currently below minimums. However, if the flight could be delayed slightly, the forecast weather of 9000 scattered, 25,000 broken, and 7 miles visibility would easily meet OPNAV filing requirements for destination weather.

The delay was accepted and the flight received its weather brief. The pilots did not file for an alternate airfield, but did discuss one which had both current and forecast VFR weather.

The flight was uneventful until Center advised, 100 miles from Fuelstop, that weather there had not cleared as forecast. Current weather was above GCA and TACAN straight-in minimums, but below circling minimums. Numerous thunderstorms were reported in the vicinity.

Weather was requested for the previously considered alternate. Alternate weather was VFR with scattered build-ups. The flight refiled and was immediately cleared to the TACAN holding fix. Enroute to the fix, the field went IFR. As all aircraft had operating radios and TACANS, the flight was broken up into three one-plane flights prior to entering IFR conditions 40 miles out. EACs were requested and received from approach control.

Upon reaching the holding fix, the lead aircraft was cleared for an immediate penetration. Alternate weather was well above circling minimums. During penetration, the aircraft passed through a series of build-ups, and the DME occasionally unlocked. The pilot considered requesting a GCA from his present position but was interrupted by an emergency transmission from Center:

"All approaches to Alternate airfield are canceled. They have lost radar and all approach frequencies."

Upon hearing this report, the lead pilot advised his wingmen to begin their approaches at each respective EAC. Each wingman had only 1200 lbs of fuel left, and the nearest possible landing field other than Alternate was over 70 miles away. Also, weather at other fields

was unknown, while the last reported weather at Alternate was above circling minimums.

The lead pilot switched to tower frequency and managed to establish radio contact 3 miles prior to the final approach fix. The pilot advised tower that he was on a TACAN final and wanted immediate landing clearance. Clearance was denied because the field had just *gone below minimums* in a squall. No amplifying weather data was given.

Where do you go in a situation like this? You're already at your alternate, you're low on fuel, approach radios and radar are out, the field is below minimums, and any other suitable field is beyond your range. A missed approach at minimums could be followed by a call to Center on guard frequency for possible vectors to try another TACAN approach. But then, will this interfere with your wingmen? A missed approach could also be followed by a call to tower or Center and a controlled ejection.

The pilot on short final in the case discussed here declared an emergency and also "busted minimums" in order to land. Weather improved prior to the arrival of the other two aircraft, allowing the pilots to land without "busting minimums." All three pilots, somewhat shaken by their bout with the weather, were safely on deck.

Instrumentmouse

The original article entitled, "Busting Minimums" was concerned with non-emergency situations. The case you report was obviously different in that it did involve an emergency. Under the circumstances, if correctly stated, the pilot had few options. His decision to **bust minimums** *was an emergency action which appears to be in consonance with Paragraph 91.3 of FAR Part 91, entitled "Responsibility and Authority of the Pilot in Command," which states:*

- *"The pilot in command of an aircraft is directly responsible for, and is final authority as to, operation of the aircraft."*
- *"In an emergency requiring immediate action, the pilot in command may deviate from any rule of this SubPart B to the extent required to meet the emergency."*
- *"Each pilot in command who deviates from a rule under Paragraph (b) of this section shall, upon request of the Administrator, send a written report of that deviation to the Administrator."*

In closing, the point ought to be made that **busting minimums** *worked out okay in* **this** *emergency situation. It may not be appropriate in every emergency situation. Each emergency must be resolved by the pilot on the merits of the particular circumstance.*

ANYMOUSE

. . . DW-242, Clearance

WE were scheduled for a 2-hour local roundrobin, instrument training flight, out of Islandhome. A noon departure was scheduled and after a myriad of details were accomplished, we began taxiing. Ground control issued our IFR clearance just the way we had filed. Climbout instructions were as follows:

"After takeoff turn left to 340, maintain 1000 feet. Contact Departure on 268.9 squawking Code 3 Mode 2000."

We taxied into position on runway 36 and were soon airborne. We turned to a heading of 340, called Departure Control, and leveled off at 1000 feet. It was reassuring when Departure said we were in radar contact because we were on the gages. They were mighty busy and we maintained heading and altitude until the 34nm fix. We were then cleared to 15,000 and for a further climb to FL180 at 60nm.

Departure was asked when and where we could turn on course. They replied that the clearance had been amended and to continue present heading. The pilot again asked for the new clearance. He was told, "Wait one." Meanwhile, we leveled at 15,000 and Departure was requested to advise where we were headed. Once more the answer was, "Wait one." In a few minutes we were passed to Center.

"Center, this is DW-242 at 15,000, request clearance." When Center heard our altitude, he wanted to know why we weren't at FL180. He advised his radar was

inoperative and to report Pope Intersection. (Still no routing.)

After five or six more transmissions a new clearance was received – *back to base*! We returned to Islandhome and the pilot hotfooted it to Operations for a few answers.

It all worked out when the facts were made known relative to who did what to whom. There were some red faces and numerous apologies. However, I'm pretty curious about whose neck would it have been if we had lost communications? This goof ended just that way – a goof. No damage was done, no injury, and everyone parted friends. Needless to say, it could have been much worse.

340 Mouse

We once heard a story about a Norfolk pilot who wanted to go to Charleston, S.C., but due to a mixup was routed to Richmond **(enroute to Charleston, W. Va.)** *before he got squared away. But that's another story.*

It isn't often that controllers get so busy they forget you and we don't know what explanations you received. However, accepting your story at face value, there are several comments that could be made:

- *You were correct to follow your departure clearance and to maintain heading and altitude assigned. We do want to emphasize one point, however, and that is,* **a pilot must maintain the last assigned altitude or MEA whichever is higher** *on any departure or arrival. Never forget that! Of course you were over the ocean and had no terrain problem, but if you had been adjacent to high ground you would have climbed to MEA,* **without clearance,** *n'est-ce pas?*
- *You were correct to keep asking Departure and Center for routing. Radar vectors are great timesavers, but a pilot better cotton-pickin' well keep a DR track. If radar becomes sour, you'd better have a pretty good idea where you are – 'cause that's where the action is.*
- *In case of lost communications you would have executed your flight plan,* **as originally filed and cleared** *(assuming no amendments), from the point of lost communications to your filed routing,* **shortest course,** *at assigned altitude or MEA, whichever was higher.*

Uh One

I WAS assisting the flight engineer who was performing an exterior preflight on our *second* assigned P-3. An AW3 noticed a loose camlock fastener on one of the panels covering the thermocouple area of the No. 1 engine.

Even though we were already late, because we had to switch aircraft, he removed the panel to ensure everything was OK. Lo and behold; he noticed several thermocouples missing! This then led us to check the other engines. We found a total of six thermocouples missing in three engines.

How come? Well, the engines had just been boroscoped which required the removal of the missing thermocouples. No QA inspection had been performed by the inspector *who signed off the work.*

If the aircraft had launched, the prospect of having three engine fire indications or fires at varying times would have been disconcerting.

Uh Two

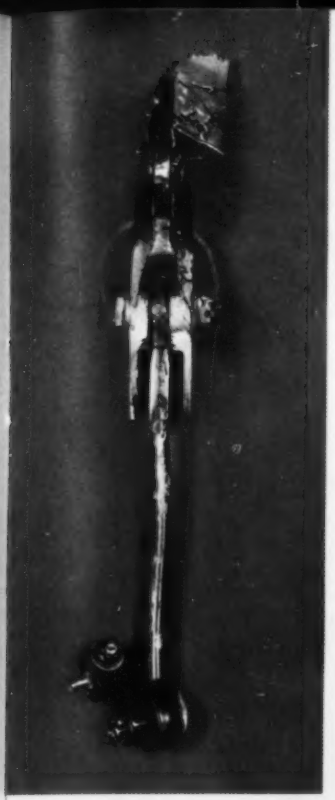
Thirty seconds before takeoff the tower notified us to return to our line. After blocking in we were advised there was no inducer valve installed on one of the engines. Maintenance control had no record of the missing part; however, Powerplants did have a record and one of the mechs called the SDO when he saw the aircraft taxiing out for takeoff.

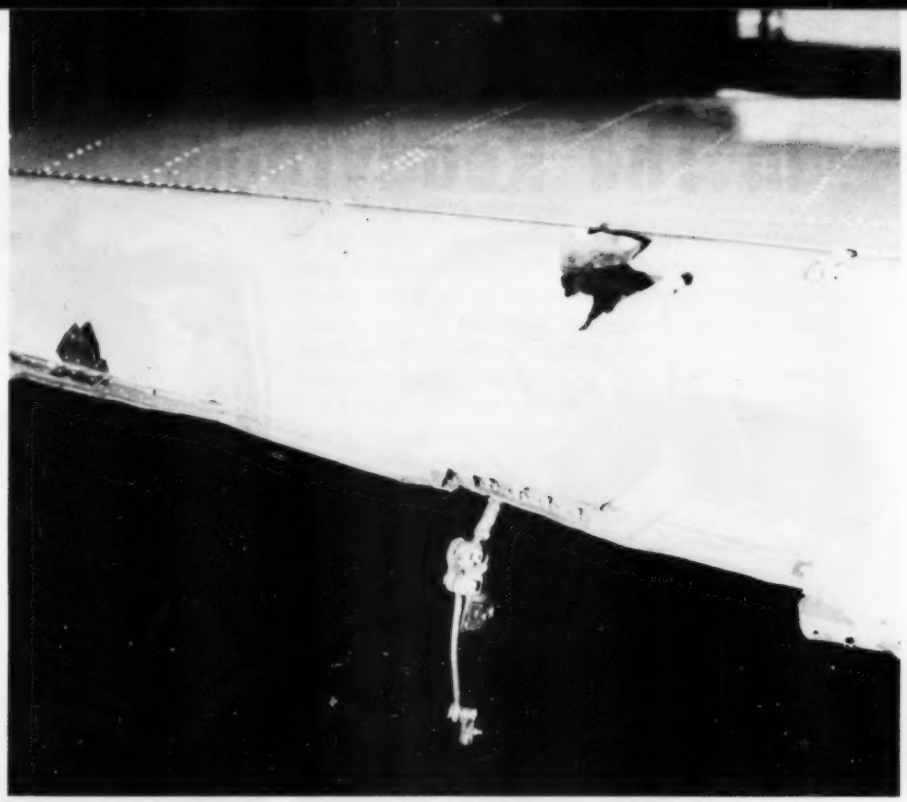
How many more incidents will it take to prove to everyone that shortcuts in maintenance NEVER pay off?

Madmouse

Only so long as it takes everyone to comply with procedures, follow directions, and proudly do the job right.

Kudos are extended to the AW3 for his thoroughness and curiosity and to the mech in Powerplants who called the SDO. **Good on 'ya.**





This INCident Could Have Been An ACCident

A T2-C pilot had just completed a calendar inspection test flight and was heading back to the NAS. As he commenced his descent, he noted a slight stick vibration when nosedown pressure was applied. Leveling off, the pilot accelerated the aircraft in an attempt to determine the cause of the vibration. At 350 KIAS, he felt a kick in the controls followed by a complete loss of elevator trim. Following a landing configuration check at altitude, the pilot executed a normal landing.

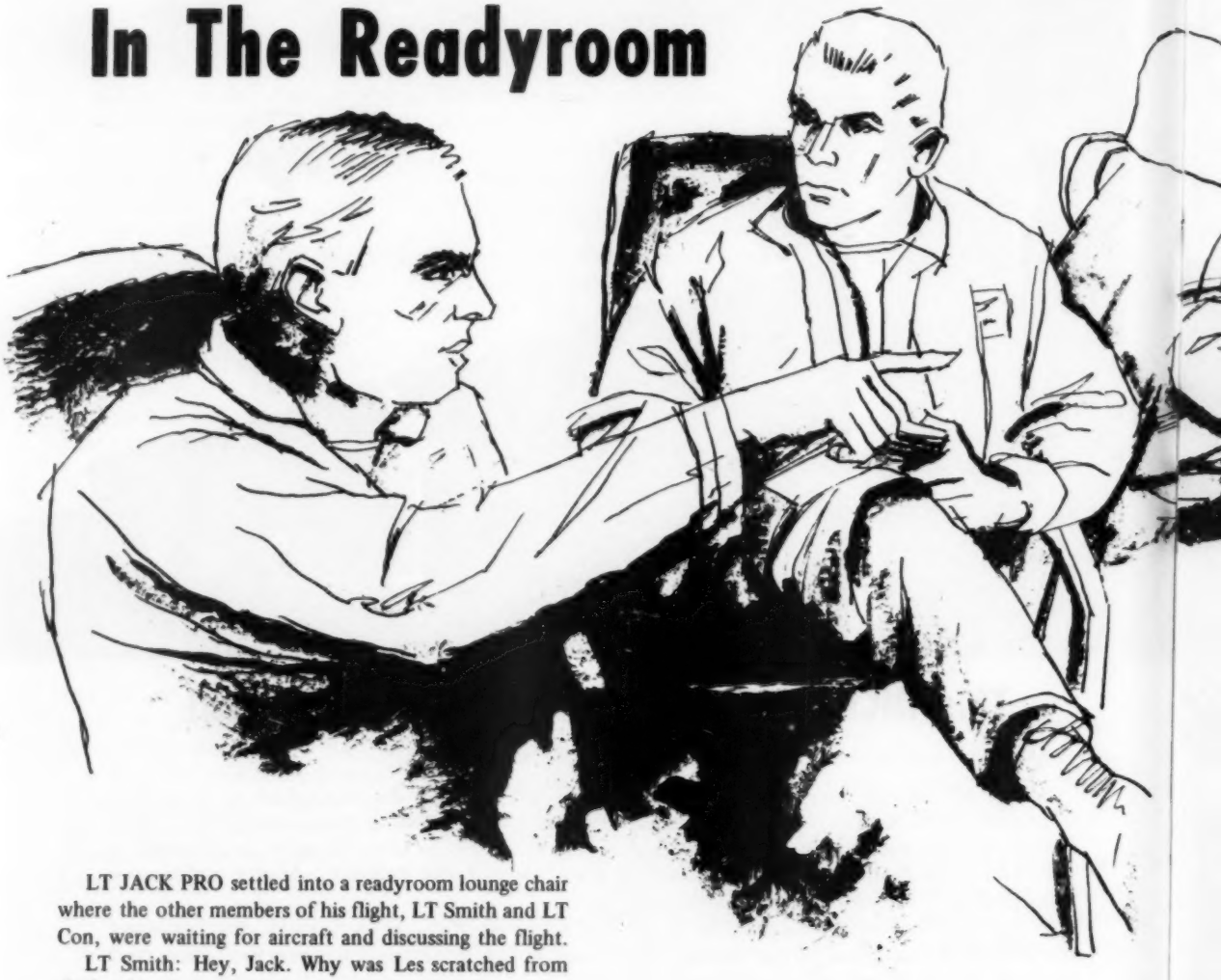
It only took long enough for the pilot to taxi back to the squadron line to determine what had caused the problem. Two-thirds of the port elevator trim tab was missing, as was the trim motor. In addition, there was a 3½" hole in the top of the port elevator, and two torn and buckled sections on the leading edge.

During the initial investigation it was suspected that a fatigue failure had occurred where the elevator trim tab actuator horn attaches to the tab. However, after a more thorough investigation had been conducted, it was opined that a dent in the leading edge of the port horizontal stabilizer was the culprit (the dent was first noticed and recorded 5 months earlier). The dent was located directly in front of the trim tab actuator horn and this disturbed the airflow over the trim tab. This caused a fatigue failure in a trim tab rib situated at station 35.812, which is the point where the elevator trim tab actuator horn attaches to the trim tab. When the pilot accelerated the aircraft to 350 KIAS the loose trim tab began to vibrate. Excessive loads then caused the trim tab to fail in the area of the failed rib. The trim tab broke in half and then tore loose at the two outer hinge points. The lateral forces generated by this action caused the trim tab motor to break free and punch a hole in the top of the elevator. These forces were also responsible for the tearing and buckling of the elevator leading edge.

It cannot be unequivocally proven that the dent in the leading edge of the port horizontal stabilizer led to this incident. However, the fact that a visual inspection of other T-2B/C aircraft with similar flight hours was conducted and no discrepancies noted, lends credence to that conclusion.

There is a definite lesson to be learned from this incident. *Never* allow dents in critical airfoil surfaces to go unattended for several months. The dent could lead to a badly bent bird. ◄

In The Readyroom



LT JACK PRO settled into a readyroom lounge chair where the other members of his flight, LT Smith and LT Con, were waiting for aircraft and discussing the flight.

LT Smith: Hey, Jack. Why was Les scratched from the hop?

LT Pro: Huh? Oh, he's investigating Miller's accident. That's why we're making this a three-plane flight instead of two sections. It'll work out, but we won't be able to do everything we had planned. We'll only conduct the portion I briefed you on earlier.

LT Con: That's bad. We're starting to lose some badly needed hops. We lost a bird yesterday and now we're losing most of this hop. You'd think . . .

LT Smith: Lost a bird? Who told you that? Buzz brought 301 back in one piece. Course it was on fire . . .

LT Con: All the same, Maintenance says it's probably a strike.

LT Smith: Well . . . at least Buzz got out okay. How about that guy? He did an outstanding job getting it on the runway. It looked like a torch from the cockpit aft. Sure took guts to stick with it.

LT Con: No one questions that . . . but was it worth it? After all, the aircraft is a strike. What did he accomplish besides scaring hell out of himself and the people in the tower? Why didn't he just punch out like NATOPS recommends?

LT Pro: That's a good point Charlie. I heard the hydraulic system was out and . . . the elevator control cable was almost burned through. Buzz didn't know it at the time, but he came within an ace of losing his elevator on final. If he had, he probably would have "bought it" because he had such a high rate of descent. His punching out would have been marginal at best. We could just as easily have been inventorying his locker this morning.

LT Con: So what is he, a hero or just stupid?

LT Pro: It's easy for us to sit here and criticize, but he was in extremis and had a lot to think about in a short time. For one thing, although the area under the approach for 32 is clear, there are several houses scattered around the pattern. Odds are that the bird wouldn't have hit anything if Buzz had ejected, but who can say for sure?

LT Smith: Either of you hear what caused the fire in the first place?

LT Pro: I haven't but the board will be tearing the remains apart soon and . . . given enough time . . . should be able to come up with all the answers.

LT Smith: This reminds me of a thought I had a few minutes ago . . . investigating this accident, writing the report, etc., is going to take a helluva lot of time and effort. And you know who's going to suffer for it? *We are!* Couple of months ago this wouldn't have been too bad, but now, just before deployment, it's going to hurt. Les will be lucky if he loses only a week of the syllabus . . . no telling how much longer it'll take to wrap up the investigation. We'll lose even more when you consider that the board will tie up three or four of us, plus the flight surgeon.

LT Con: Glad I'm not involved. In fact, I've often wondered why individual commands are saddled with such investigations. This one shouldn't be too bad since we've got the aircraft to work with, but I've seen accidents where the wreckage was strewn over a square mile. Can you imagine how someone like Les Jackson, LCDR type, with no formal training as an accident investigator, would feel standing in a muddy field and surveying that square mile?

LT Smith: *I know how I'd feel!* Why doesn't the air wing or the type commander establish a standing aircraft mishap board to do all the investigating? That would relieve us of the load and let us get on with the flying. And with a standing board, there would be formally trained investigators.

LT Pro: LCDR Jackson probably wouldn't be as lost as you imagine. Squadron safety officers assist in the investigations and in most cases have some formal training . . . maybe not as much training as investigators, but they do know how to proceed. I mean, they know what reports have to be made and who to call on for assistance.

Fact is, there's a whole bunch of facilities and experts, military and civilian, available to the board for the asking. In the case of Buzz's accident, we'll be able to get a disassembly inspection report of the engine or any suspect accessories.

Another thing . . . the example you used of an aircraft scattered over a square mile . . . the Safety Center routinely sends a trained investigator to any accident where aircraft destruction and wreckage is beyond the reasonable capability of the local board. Of course, that doesn't relieve the board of its responsibilities, but they can use the results of the Naval Safety Center investigation as they see fit.

LT Con: Well and good, but I still think the air wing or type commander could take over the functions now done by the local board.

LT Pro: Sure, but can you imagine the staff they'd need . . . the administrative support? . . . Not to mention the travel funds . . . the delays in getting to the accident site . . . and these aren't the only considerations. For example, the squadron is vitally interested and maintains essential data concerning the aircraft and pilot. They have *first hand* knowledge of the tempo of ops, the operating environment, past maintenance, records, personal traits and problems of the pilots . . .

LT Smith: Yeah . . . I can see where all that might be important in getting at the underlying cause factors . . . also, I can see where it might be important when they get around to deciding whether Buzz is a hero or a bum – or somewhere in between.

LT Pro: Absolutely.

LT Con: Even so, I can see other arguments against . . .

Squadron Duty Officer: Hey guys, your planes are ready. Up and at 'em tigers!

TO BE CONTINUED FROM TIME TO TIME. ◄

RECREATIONAL seamanship

THE FIRST week in July is, by Presidential Proclamation, National Safe Boating Week.

"Many boating tragedies could be avoided through education and common sense," the President states. "I urge all Americans who use our waterways to take advantage of the numerous boating safety courses offered by governmental and private organizations, such as the United States Coast Guard, the Coast Guard Auxiliary, the United States Power Squadrons, the American Red Cross, and various state agencies."

For instance, the Coast Guard Auxiliary offers free public education courses in boating safety and seamanship conducted by experienced, qualified auxiliary members. The courses are designed for both the beginner who wants to acquire a basic knowledge of boating and for the more experienced boatmen who would like to brush up and review the fundamentals.

Three separate boating safety courses are offered:

Outboard Motorboat Handling (1 lesson): The main emphasis here is on safety – the safety practices all outboard owners should know. The course covers the fundamental rules of boat handling, equipment requirements, and rules of courtesy afloat.

Safe Boating (3 lessons): Presented in either 3 weeks, 1 week or 1 day, this course provides the elements of seamanship, aids to navigation, rules of the road, and boating safety for both outboard and inboard motorboat operators.

Basic Seamanship (8 lessons): This is the auxiliary's most complete course. It covers marlinspike seamanship, rules of the road, aids to navigation, piloting, safe motorboat operation,

and boating laws. Those successfully completing this course are awarded the U.S. Coast Guard Auxiliary basic seamanship certificate.

The Coast Guard Auxiliary also offers a courtesy motorboat examination by a qualified auxiliary member. It's free, and there is no obligation. If your boat does not have the proper equipment, no report is made to any law enforcement authority. The auxiliary examiner will tell you the deficiencies so you can correct them. If your motorboat passes the examination, you will get the auxiliary's official courtesy motorboat examination decal.

Make sure you and your family know what you are doing when you go out in a small boat. If there's room for improvement in your small boat handling, check with the Coast Guard Auxiliary or one of the other agencies listed above, and brush up on your recreational seamanship.

DESIGN FOR

"I THINK the engine stalled . . . Would you check it over and, oh yeah . . . let me know whatcha find?"

That's what LT Staller (F-4 driver) said to the maintenance supervisor after yesterday's hop. That was the same bird in which I had experienced a compressor rumble no more than 2 days ago. I didn't write it up because I thought I'd goofed in my pullup on a low-level recco pass. But then my curiosity got to me so I called up an old friend, A. Grate D'Zeiner, for some facts.

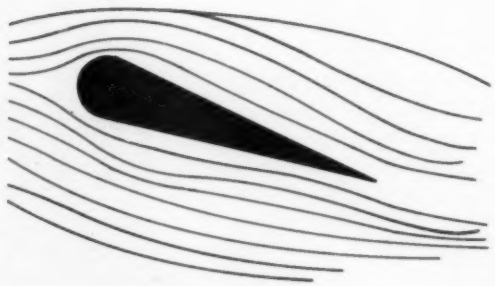
"Well, the perfect compressor would operate on an isentropic process. Now, an isentropic process results in a minimum temperature ratio across the compressor for a given pressure ratio. Therefore, the efficiency . . ."

"Hold on," I interrupted. "In plain language, why does an engine stall?" Well, I still didn't get very far but I remembered some articles I'd seen in the readyroom . . .

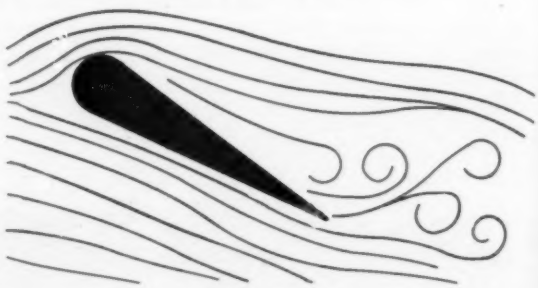
First, let's clear up one point! All explosive sounds, whines and growls or similar sensations you might experience are not engine stalls. But before we get into the recognition of an engine stall, it would help to know what happens and why.

We're all familiar with the way an aircraft wing stalls. When the angle-of-attack is increased beyond a critical value the lift rapidly decreases and the drag increases greatly. Figure 1 shows a simplified airfoil and this effect. Since the axial flow compressor is made up of a series of specially shaped airfoils, the application of this principle applies as well to the axial flow compressor of a jet engine. I mention axial flow because most of our equipment these days is this type.

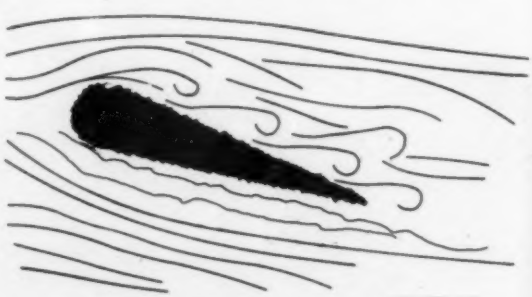
The compressor rotor has hundreds of fixed airfoils rotating like a propeller blade, each one creating a pressure rise in the air being supplied to the combustion section. The compressor stator which is also comprised



Normal Attack Angle



High Attack Angle



Normal Attack Angle, Rough Surface

Fig. 1

1. AIRPLANES, MILITARY -- Stalling
2. COMPRESSORS

STALL

By E. L. Venturini
Aircraft Engine Group
General Electric Company

illus 20-23

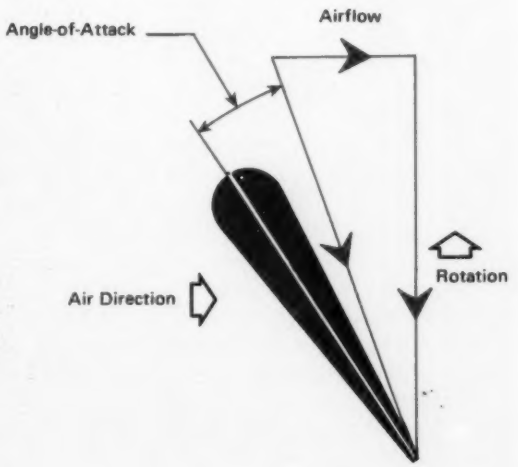
of hundreds of fixed airfoils directs air in the compressor cycles. In the process either blades have the capability of stalling much the same way as the airplane wing. If you isolate one blade in the compressor rotor for a closer look, Fig. 2, you see a cross-section of a blade airfoil, its rotational speed vector and the air direction with its resultant velocity vector.

As in the case of an aircraft wing, if the angle-of-attack is too great, the airfoil will stall. It is not necessary that the entire airfoil be involved. A stall can initiate in the tip or hub area, persist as such or progress into a full-fledged stall. Since the blade is fixed, what changes the angle-of-attack? There are four factors that influence this; (1) the air velocity, (2) the blade or engine speed, (3) the stator vane position and (4) the desired pressure rise.

The diagram in Fig. 2 depicts one given condition, and a similar diagram can be shown for a stator blade. The compressor must be designed to function efficiently at an indefinite number of conditions as set forth by aircraft speed and altitude and all kinds of weather. That is, inlet air temperature, pressure and humidity, as well as the engine RPM and its condition.

As an example, let's consider a case where the engine is running at a stabilized speed. Air enters the compressor flowing axially; however, to the rotating blade it appears to be flowing in the direction of the resultant as shown in Fig. 2. The air is compressed and in the process, exits each stage with a velocity somewhat in the direction of rotation. Stator vanes then turn the air to the proper direction or angle-of-attack for the next compressor cycle, etc., through the entire compressor. Now that's for only one condition. As mentioned, in the design of a compressor many variables must be considered. The engine speed may vary from 0 to 15,000 rpm, engine inlet temperature from well below freezing to above boiling, and operation may be at various altitudes. The compressor, irrespective of conditions, must produce and yet not stall.

How's this done? For every compressor design, a dimensionless plot can be made of compression ratio versus air flow. A typical compressor map is shown in



Cross-section of compressor blade airfoil.

Fig. 2

Fig. 3. The diagram also defines the constant speed and efficiency lines. Air flow increases with speed, and to gain efficiency and better performance, a greater pressure ratio must be realized. The higher the pressure ratio, the higher the angle-of-attack, and the closer the engine operation to the stall line. However, operation is critical and stepping over the line will lead to a stall. So what happens . . . you devise an operating line which skirts the critical line with some degree of margin.

The operating line is the product of much development testing and engineering judgment. Operation of the engine along this path is accomplished in many different ways. In the variable compressor stator system, the early stage vanes are positioned as a function of inlet temperature and engine speed to maintain the proper control of the airflow.

The pressure ratio is controlled by many parameters, yet fixed by the geometry of the basic engine.

The fuel scheduled for combustion during acceleration and the corresponding exhaust nozzle area will affect the pressure in the system. These schedules must be compatible. Dual-spooled compressors accomplish much the same end by providing an RPM match between forward and aft stages at all speed points (higher speed ratio in aft stages during acceleration). A compressor bleed air system regulates the pressure rise in the transient speed range. Once a suitable operating line is established, intentional stall tests are conducted to evaluate the final product.

Now that's how it works, but why doesn't it always?

I'm glad you asked! The conditions we've discussed were ideal with only some degree of provisions for changes in stall margin which may come about in the course of field operation. The compressor air flow characteristics will change as affected by airfoil corrosion, dirt and even foreign object damage. Control schedules or regulating valve operation can change with time.

When the airfoil surfaces of the compressor become rough from corrosion or dirt deposits, the airfoil becomes prone to flow separation, turbulence and eventually stall. Obviously the answer to this problem is corrosive resistant materials or protective coatings.

Well, both approaches have shown significant improvement in the past few years and are being incorporated in the engine designs. Wash – oil and walnut shelling techniques have been developed to clean up the old designs and keep them going between overhauls.

Foreign object damage to compressors has taken its toll in stalls. It is not hard to understand why the disturbance generated would cause a stall. See Fig. 4. The turbulence created would be comparable to that of

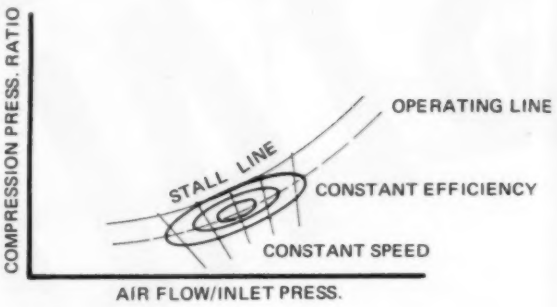


Fig. 3

an iced wing or as in a high angle-of-attack.

Nothing's been mentioned about aircraft/pilot induced stalls. These occur from the ingestion of hot gases from rockets or guns, inlet ramp schedule failures, spins or other exotic *maneuvers* – all produce a distorted pressure profile at the engine inlet. The cases cited here have caused engines to stall which were not even stall prone.

The symptoms of an engine stall may vary among the different aircraft, however, most common displays are a sudden increase in exhaust temperatures, some RPM loss or hang-up, a thrust decrease and frequently an audible report. Compressor stalls can generally be cleared by reducing power, however, one should refer to the

Fig. 4

appropriate manuals for the recommended procedures.

Now let's review . . . Oh, there's the maintenance chief Ringitout, on that bird LT Staller brought back.

"Hey Chief, Whadya find?"

"Afraid it's FOD sir!"

FOD huh . . . wonder what they call FOD in foreign countries? Whatever it's called it's costly, and won't Staller be happy to hear the news, being the maintenance officer.

You recall the cause factors: Compressor corrosion, FOD, exhaust nozzle malfunction, fuel control schedule, inlet ramp failure. Many can't be foreseen it's true, but still a good percentage are not recognized during maintenance.

In summary, the best pilots are familiar with the recognition and proper corrective measures in abnormal or emergency conditions . . . .keep ahead or at least current on engine stalls. And mechanics, your work should never stop in preventing stalls through good maintenance practices.

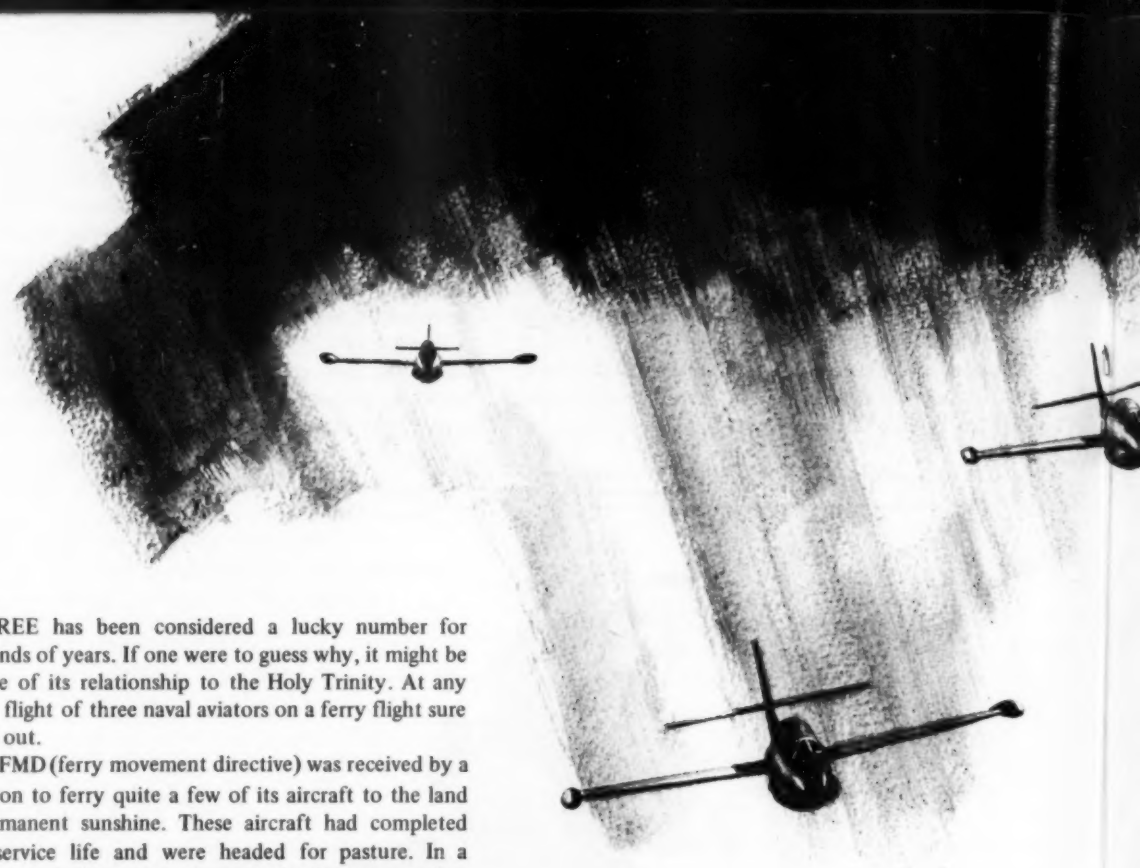
Don't forget, if you guess, you might be wrong and if you think you guessed right, you only thought you knew! Be professional. *Know the bird cold* and operate it IAW NATOPS. ◄

Be Sure the Aircraft is Ready

LAST minute maintenance performed on an aircraft after crew manning increases the risk of error. A recent example involved the loss of an A-6. The pitot-static system was drained to correct an altimeter discrepancy just prior to a night catapult launch. Immediately after launch, the altimeter rotated counterclockwise, indicating pilot disorientation. The crew ejected.

Cause of the mishap was inadequate integrity check of the pitot-static system after maintenance had been performed. The lesson to be learned is that specified system checkout and quality assurance inspection is essential after maintenance action *prior to releasing the aircraft for flight*. This is especially true during the accelerated tempo of carrier operations.

COMNAVAIRLANT Weekly Safety Bulletin



Destination, To Alternate, To Divert

THREE has been considered a lucky number for thousands of years. If one were to guess why, it might be because of its relationship to the Holy Trinity. At any rate, a flight of three naval aviators on a ferry flight sure lucked out.

An FMD (ferry movement directive) was received by a squadron to ferry quite a few of its aircraft to the land of permanent sunshine. These aircraft had completed their service life and were headed for pasture. In a manner of speaking, they *deserved* the farm. In another manner of speaking, their pilots almost *bought* it.

When word of the transfers became known to all, there was lots of good natured banter among the pilots as to who would ferry them. One or two of the fast-buck artists allowed as how they would be willing to negotiate if it became their lot to be selected. They let it be known that for a price they would relinquish their assignment to a less fortunate pilot who hankered for the low humidity, brilliant sunshine, and the sights and sounds of the living desert.

The list of pilots and aircraft was posted and loud was the glee of those selected – even louder the moans and groans of those not so lucky.

Three pilots who had wished to make the flight together received permission to do so. They spent the day before departure getting ready. They got in everyone's hair. They bugged the administration officer for orders, the supply officer for cross-country packets, the maintenance officer for inventory lists and log books, the navigation officer for all necessary nav pubs, and other officers and offices for various and sundry items.

That night at home, when queried by their wives about their inordinately happy demeanor, they all, with long faces and apologies, explained they had been "ordered" to ferry some aircraft. Typical comments heard by the ladies that night were:

"Yes, dear, I told Ops about our anniversary but they said there was no choice."

"Yes, sweetheart, I asked if I could trade with someone who wanted to go."

"No, love, I don't think we'll be gone more than one night, but you never can tell about the weather, or mechanical condition of the plane, or . . . "

On the morning of departure, local weather was so-so. It was neither good nor bad. However, the weather gal on the local radio station was bad-mouthing things for later that day. Our lucky trio, therefore, was not surprised when meteorology told them of bad weather to the west. They understood it was due to a fast-moving front, but by the time they reached petrol stop No. 1, all would be clear. They launched.

Their first destination was an AFB a mere 300 miles away. The short leg was necessary because, without external tanks, they had no other choice. The weather dictated it.

The leader experienced transmitter problems after takeoff so No. 2 did the communicating for the flight. (Small gray cloud.) Just as the flight passed a checkpoint station, No. 3 lost all navigation aids. However, the trio kept boring westward. They checked in with Metro for their destination weather and were informed it was 300-1. (No problem.) They pressed on.

Ten minutes later Center advised the flight that their destination weather had deteriorated to 200-½ with rain. They acknowledged this bit of news, cheerfully, still not perturbed. Aerology had forecast frontal passage at their destination while they were enroute. The next communique changed everything. Center advised their destination was then 100-1/8 and added the clincher – *no improvement expected*. (The pucker factor now rose a tad.)

It was time to alter everything – destination, course, and altitude. They headed south. Their alternate was 800-3 and improving. No. 3 then lost his transmitter and No. 2's TACAN became intermittent. (The gray cloud following them was darkening.)

The leader contacted Center and the flight was cleared for an enroute descent for GCAs to the alternate. The flight descended to 4000 feet, VFR between layers, but their approaches were delayed due to traffic. No. 2 was finally handed off to Approach Control for a separate GCA. He switched frequencies and descended to 1700 feet. While complying with instructions, he lost his TACAN. (However, worse things were about to happen.)

KAPOW! Lightning struck the tower. All frequencies became strangely quiet. Center came up on guard and informed one and all of the situation. Approaches were canceled and all aircraft were requested to remain VFR.

No. 2, in the soup, switched back to the last frequency his flight had used and climbed back up between layers. As he broke out he saw a distant two-plane formation and rapidly joined on his buddies. Fuel was getting low and the gray cloud that had followed them since takeoff was now black.

The leader called Center, advised the controller of their low state, and requested a suitable divert – any field with 6000 feet of concrete. Center suggested a municipal airport, 90 miles north, which was VFR. There was no other choice. The leader had the only operating TACAN and although their divert field had no radar, it was served by a VORTAC station. (Who among you, under the circumstances, wouldn't have proceeded forthwith?)

The leader contacted municipal tower, received the weather (Glory be. 'Twas VF&R.) and the altimeter setting. The flight was cleared to land. All three made uneventful landings and had enough fuel to taxi among a batch of Cessna 150s and 172s to a parking spot and shutdown before flameout.

They had covered a distance of 200 miles, in a direct line, from their point of departure. (Sometimes ferry flights do not cover too much distance.)

Epilogue

Our fearless trio's problems on the ground then began. They had landed at an airport without starters, without the proper fuel, and without a nearby motel or golf course. Undaunted by these adversities, they kept making telephone calls until finally, 10 hours later, help arrived from their original destination.

In spite of the problems they had encountered, their luck held out and their day was made when a civilian stopped them on their 33rd trip to the parking ramp and asked, "Are you the pilots of those Navy interceptors?"

This episode has to be a living example of why OPNAVINST sets forth the fuel requirements that it does. You make your own comments concerning flights in IMC without operating communication and navaid equipment. They did hack it, didn't they? Who knows, the date of the flight could have been 17 March! But then, is the luck o' the Irish guaranteed?

1. ACCIDENT PREVENTION
2. AIRCRAFT MAINTENANCE
3. ACCIDENTS, AIR -- Causes
4. REPORT WRITING

There's Many a Slip 'Twixt the Cup and the Lip . . . and figuratively speaking, at least a few of them occur during flight operations.

Write It Right!

Illus 26-28

A SECTION of A-4E *Skyhawks* launched on a local training flight. After 10 minutes, the section commenced a shallow descending turn from 4000 feet, while reducing power to 90 percent RPM. About 15 seconds after rolling out of the turn, the leader experienced a muffled "bang" as his wingman caught a glimpse of "something" coming from the tailpipe. The wingman was unable to identify the emission; only that it caught his attention.

After hearing the muffled noise, the leader experienced moderate vibrations and noticed a power loss as the RPM slowly unwound toward 80 percent. No other indications of a malfunction were noted.

After discussing the problem briefly with the wingman, the leader selected the manual fuel system which arrested the RPM drop momentarily but produced a fluctuating RPM between 80 and 85 percent. Flames, 6 to 7 feet long, were observed emitting from the tailpipe in a manner similar to a "cycling afterburner." A heavy stream of fuel was then observed coming from the tailpipe.

With the aircraft vibrating heavily and his wingman directing him to eject, the leader zoomed the aircraft to about 4000 feet, 230 knots, 20 degrees noseup, wings level, and pulled the face curtain. His ejection was successful, and he was rescued from the water by fishermen. The aircraft was lost at sea.

The mishap board was unable to determine the exact cause of engine failure but concluded that it most likely involved the collapse of a combustion chamber. The board did, however, uncover a series of events which were considered contributory to the accident.

Three days prior to the accident, another pilot had taken the aircraft on a cross-country. At the end of the first leg, during a GCA, the pilot felt a small vibration in the stick, but all other indications were normal. After landing he checked the compressor blades for FOD and found one blade had a hole in the leading edge about the size of a quarter. However, he noted blue paint around the hole, indicating it had been blended at PAR.

During the return flight (on the following day), the pilot noticed, as he made small power changes, momentary bursts of power. These bursts were not great and lasted only for about 2 seconds.

Entering the pattern at homefield he experienced vibration noticeably worse than that noted on the previous leg. According to the pilot, the aircraft felt "like a reciprocating engine rather than a jet."

On the taxiway after landing, he opened the canopy to listen to the engine. He heard rumbling sounds and was still able to feel the vibrations. After shutdown he mentioned to his flight leader that the aircraft felt and sounded "like a Mack truck."

He described the engine symptoms to a supervisor in maintenance control but wrote up the yellow sheet using very few words, i.e., "Check for possible FOD engine."

Thereafter, the supervisor issued a JCN to the

powerplants work center to check the engine for FOD. He did not pass on the verbal comments of the pilot concerning the engine symptoms. The mechanic assigned to check the compressor section noted several compressor blades which had been blended and marked with blue paint, as required. He pulled a functional low-power run-up and found no malfunction. The aircraft was then put in an up status. The accident occurred on the next flight and involved a different pilot.

The commanding officer, in his endorsement to the mishap report, stated in part:

"A very strong possibility exists that the impending engine failure could have been detected and prevented by the squadron. Even though the pilot only wrote up the aircraft discrepancy as 'Check for possible FOD engine,' his verbal statement indicates that the malfunctions noted during this flight were serious, prolonged, and different from indications associated with FOD. His discrepancy report should have contained the indications, i.e., power surges, vibration, rumblings, and normal instrument readings in dirty configuration at high power settings.

"The squadron maintenance effort may have been far more extensive had the aircraft discrepancy report been thorough. However, the pilot stated he had briefed the maintenance control supervisor on the aircraft symptoms. The supervisor disregarded the briefing but did have the aircraft engine visually checked for FOD and turned up at low-power. No checks were conducted to discover the cause of power surges or vibration.

"The aviators verbal brief is an important assist to maintenance personnel in analyzing and correcting aircraft discrepancies. Obviously, in this accident, the pilot believed his brief to be of more significance than did the maintenance control supervisor.

"It is absolutely essential that all aviators record complete and precise descriptions of aircraft discrepancies. It is equally essential that all maintenance personnel initiate aggressive, thorough, and careful action to determine the nature of discrepancies so they may be corrected."

Could this happen in your squadron? Do pilots recognize the importance of a careful and complete yellow sheet writeup, in addition to a verbal brief? Equally important, do your maintenance personnel recognize the importance of following up discrepancy reports, *regardless of how received*?

It might be worthwhile to review these items at the next all officers meeting or safety council meeting. ◄

A Herky Bird Nest

APPARENTLY some smart bird has found a fast way to make his annual migration. Not liking the winter winds of CONUS he decided to hitch a ride inside the engine cowling of a "Herky Bird" (species EC-130Q) on a ferry flight to Guam. No one knows why this stowaway was not discovered during the preflight inspection at homebase. He was a lucky bird. His nest was still intact and not caught in the throttle cables or sucked into the intake. Now I ask, who likes to be flying along at 20,000 feet and have his bird nest catch fire from the heat of an engine? Bird nests belong in trees, not in aircraft engines.

This mishap graphically illustrates what can happen when proper procedures are not followed. In this case, one wrong move by an individual led to two more, and turned a *minor incident* into a $1300 *ground accident.*

This Bird Busted a Birdcage

AN A-6A was parked in the hangar bay with the birdcage (extensible equipment platform) extended. Because maintenance was being performed, the birdcage could not be raised hydraulically. In addition, the main landing gear struts had not been serviced. This placed the bottom of the lowered birdcage just 5 inches from the deck instead of the normal 10½ inches.

Maintenance control wanted the aircraft moved from the hangar bay to the squadron line. The supervisor assigned to move the bird was experienced in the movement of A-6 aircraft. He was assisted by a brake rider and three wingwalkers. There was no tractor driver available, so the supervisor decided to drive the tractor himself. The aircraft was moved without mishap to a position clear of the hangar bay. The wingwalkers were then secured because it was raining.

The supervisor commenced towing the *Intruder* towards the line, but the route taken made it necessary to cross a ramp covering the pneumatic lines of a Wells Airstart Unit. The tractor crossed easily, but as the A-6 nosewheel started up the ramp a dragging sound was heard. The brake rider immediately set the parking brake.

The supervisor left the tractor to see what had happened. The 4-inch vertical rise in the ramp had caused the tail section of the *Intruder* to rotate downward causing the birdcage to strike the concrete ramp. At this point, however, no damage had occurred.

The supervisor then decided that by backing the aircraft he could maneuver it into its spot without crossing the Wells ramp. Unfortunately, this backing movement caused a further nose-up/tail-down position, and the birdcage again struck the concrete ramp. This time it became wedged in place.

It's hard to believe, but the supervisor looked the situation over and decided that *further backing would free* the jammed unit by forcing it to rotate toward its closed position. He jumped onto the tractor and started backing up. Supporting members in the birdcage failed, rivets sheared, and the floor was bent away from its support. *The mishap was then reported to maintenance control.*

It's obvious that the cause factor of this mishap was poor headwork while moving an aircraft. Had the A-6 not been moved with the birdcage extended, and had maintenance control been notified immediately after the initial crunch, little or no damage would have resulted.

In his report, the investigating officer made note of the senselessness of this mishap. Earlier, that same day, line personnel were observed moving aircraft without adequate personnel or supervision. This prompted the line division officer to gather his troops together for a rehash of proper procedures and the importance of adhering to them, while moving aircraft.

The CO offered some solid recommendations to avoid future mishaps of this type. They were:

- Except in emergencies, A-6 aircraft should always be moved with the birdcage in the up position.
- Instruct all personnel involved in the movement of aircraft to periodically review aircraft physical characteristics and the areas to and through which the aircraft will pass (e.g. strut extension; brake system; panels open, loose, or removed; low overheads; inclines; surface conditions).
- Reemphasize that aircraft movements must be properly supervised and that crews are adequate, qualified and properly equipped to do the job.
- Keep personnel aware of their responsibility for the safe and economical operation of naval aircraft. *Mishaps cost money.*
- Ensure that all personnel understand the procedures to be followed in the event of a mishap, to preclude further damage by unskilled attempts at salvage.

The CO's final recommendation was, "Disseminate widely the contents of this report in the hope of eliminating complacency and preventing a similar mishap in other commands."

"Your wish is our command, Skipper." ◄

NATOPS...

Still The Best Way

SELDOM, if ever, is an accident attributed to compliance with NATOPS. Conversely, a substantial number of accidents do involve *noncompliance* with NATOPS and other recognized SOP. For example:

Attempted A-4C Takeoff in Manual Fuel Control

Preflight, start, and poststart checks by an A-4C pilot were apparently normal. During the manual fuel check at idle RPM, the pilot noticed a dim manual fuel control light, a distraction which later may have caused his failure to return the fuel control to normal. He advanced and retarded the throttle to check engine response in manual fuel control.

The action of advancing and retarding the throttle is not a standard NATOPS procedure; it was a habit picked up by the pilot from previous experience in other aircraft. The NATOPS check calls only for placing the switch in manual, checking a flicker in the fuel flow with the warning light on; then, placing the switch in normal while again checking a flicker in the fuel flow with the warning light out. As it turned out, the pilot left the fuel control switch in the manual position during the poststart check.

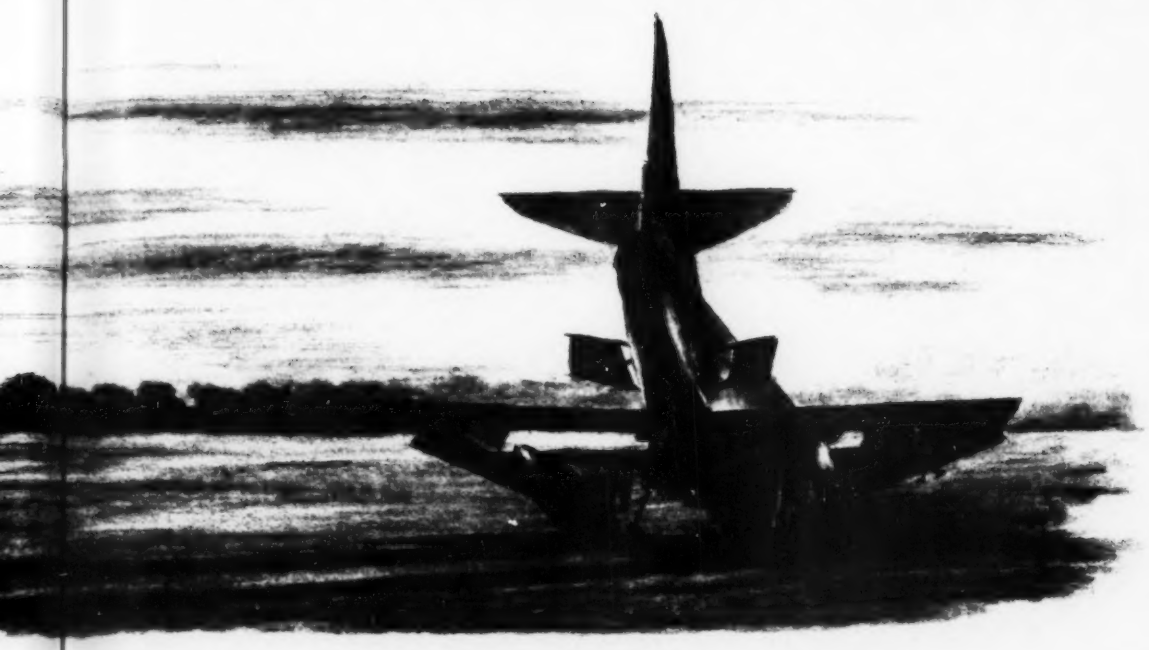
He taxied to the end of the runway, advanced power to 85 percent to check instruments, and jam-accelerated to full power while releasing the brakes. Two deviations from NATOPS occurred during this sequence which had a direct bearing on the subsequent accident.

NATOPS, for a single-plane takeoff, calls for a jam-acceleration from IDLE to FULL power with release of brakes as RPM passes 90 percent. Engine acceleration is timed from IDLE to FULL power and from 75 percent to FULL power to ensure minimum acceptable acceleration time. Had the pilot adhered to these prescribed checks, he may have discovered that he was operating in manual fuel control.

The EGT during the initial part of the takeoff roll was observed passing 590°C reaching 620–640°C. RPM was slightly more than 102 percent during the initial part of the roll but acceleration was noted to be slow and sluggish. At about 95 knots, the pilot observed the RPM had dropped to 97 percent with the throttle at full military. He decided to abort.

He called,"aborting," retarded the throttle to idle, put out the speed brakes, applied forward stick, and commenced heavy braking. Seven hundred feet before the E-28(B) arresting gear (1500 feet from the end of the runway) he dropped the tailhook. Unfortunately, it failed to engage a cross-deck pendant.

Realizing that he would be unable to stop the aircraft on the runway, he shut down the engine and continued



heavy braking. The *Skyhawk* continued off the runway, through 1000 feet of overrun and 250 feet of soft dirt. The nose gear collapsed. There was no fire, but the aircraft was substantially damaged. The pilot was uninjured.

The aircraft mishap board commented, in part:

"He is an extremely confident pilot. He tends to incorporate additional procedures from previous aircraft and from his own experience into NATOPS.

"The fact that he advances and retards the power lever while the fuel control switch is in manual interrupts the normal sequence of the prescribed NATOPS checks and increases the likelihood that a disruption will cause him to omit the final steps.

"The acceleration check performed at the end of the runway is similar to the check used for section takeoffs in the A-4C and single plane takeoffs in the A-4E, which the pilot had previously flown.

"The fact that the pilot did not immediately abort his takeoff with the RPM under the required minimum of 103.6 percent is a definite contributing factor. The pilot thought that the aircraft would become airborne safely with less than 103.6 percent because section takeoff procedures in the A-4C require a throttle advance to a minimum of only 98 percent. This, and the fact that the pilot is extremely confident (and wanted to fly the mission), is undoubtedly the underlying cause of this contributing factor.

"Upon recognizing the abort situation, the pilot initially felt that he had the situation under control and therefore retarded the throttle to the idle position. After realizing the extreme situation (missing the arresting gear) he shut down the engine as prescribed in NATOPS abort procedures. If the pilot had shut the engine down upon initiating the abort procedures, it is believed that the aircraft could have been stopped on the runway.

"Strict adherence to NATOPS checklists and procedures would have prevented this accident.

"The computation of takeoff distance, speed, and line speed are part of NATOPS procedures. However, special emphasis should be placed within the NATOPS system on these important planning factors. It is therefore recommended that such computations be made a mandatory requirement prior to every land-based flight.

"Emphasis must again be placed on the fact that NATOPS is the best way to accomplish a task. Pilots must be impressed with the fact that knowledge of and adherence to these procedures is essential to the conduct of naval aviation."

Enough said. ◄

It's night. It's a strange airport. Some lights are out. Some taxi lines are obliterated. You're apprehensive. Ground control answers you, "Triple nickel, clearance on request. Advise when . . ."

READY to T

HAVE YOU ever been in this position? Sound familiar? Of course, it could be the other way around, too. You've just completed rollout at an unfamiliar airport, turned off the runway, and now you're faced with taxiing to some distant area on the airport to shut down.

Ground operations at night (or in daylight when reduced visibility prevails) at a strange airport is confusing. Pilots have reported they were completely disoriented – lost on the airport – with no idea of which way to go or which line of lights to follow. It is often hairy at Homeplate under certain conditions, even when you think you know where you are.

Most military airports provide the best ground director in existence, a Follow-Me truck. However, if you're operating from a civilian field or a military airport that does not provide this service you're on your own. All alone and confused.

608, Do You Need Help?

A pilot departed Homeplate at 2330 on a 3-hour navigation flight. Upon return he was cleared to land on runway 22. It just so happened he had never landed on this runway at night. He rolled out to the end and turned left to taxi back to his line.

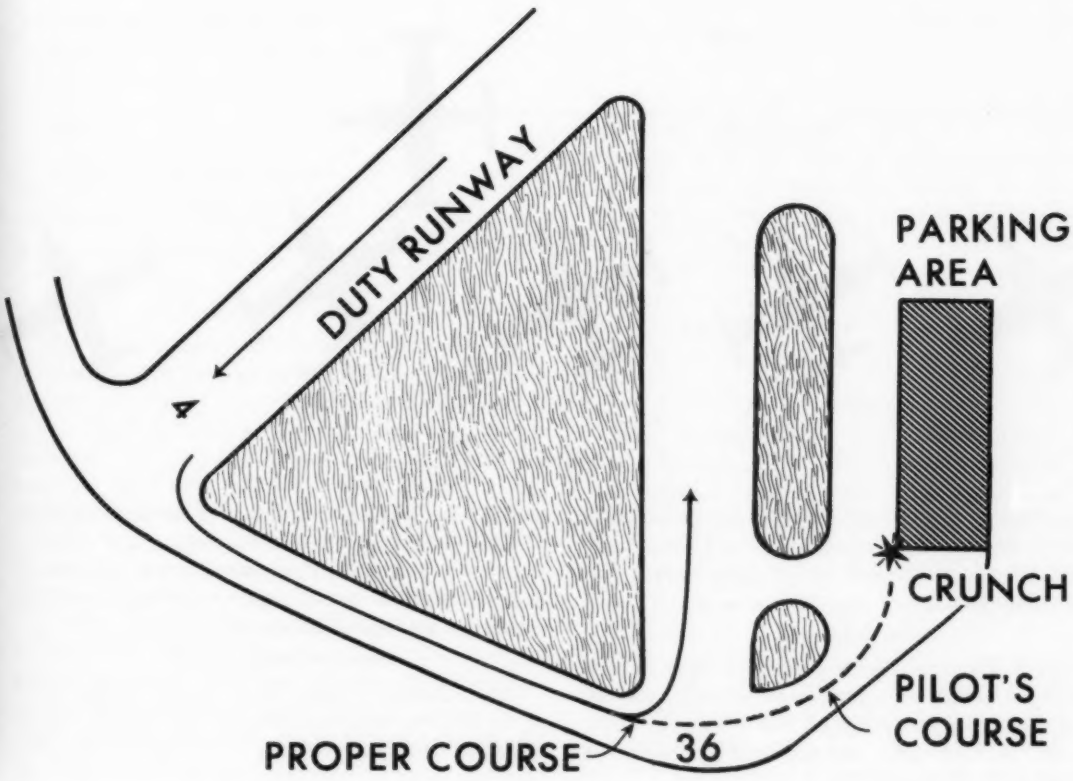


Fig. 1

1. ACCIDENTS, GROUND (AIRCRAFT)
2. ACCIDENT PREVENTION
3 GROUND SAFETY

illus 32 – 35

o TAXI.

While taxiing, he admitted he was uncomfortable because of the unfamiliarity of his surroundings and because of a bright glare emanating from open hangar doors in the distance. He did not turn north on 36 (the off-duty runway) as instructed. He was taxiing northeast, *thinking* he was on 36, when he realized he was in an area too dark (a parking area) to be on the off-duty runway. (See Fig. 1.)

The next instant, he noticed a reflection from a parked aircraft and applied brakes – Crunch! He came to a full stop as the tower was asking the question, "608, do you need help?"

229, Return to the Line

A pilot left the chocks and made a turn to intercept the taxi line leading to the duty runway. He was hurrying to join the rest of his flight. He lined up his nosewheel on the taxi line, checked wing clearance with the parked aircraft on his right, and scanned left to determine how best to reach the hold-short spot.

He was unfamiliar with the taxi routes at the field and, even though it was broad daylight, after passing three parked planes he contacted a fourth – tiptank to tiptank. The pilot did not feel a jolt, nor did he realize

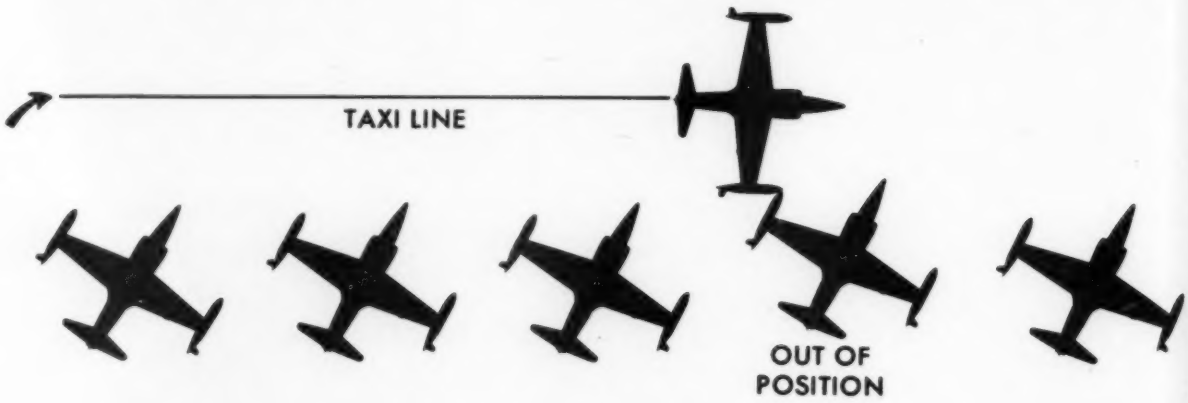


Fig. 2

he had struck another aircraft. He continued taxiing until the tower advised, "229, return to the line." The aircraft he had hit was parked well out of sequence with the others. (See Fig. 2.)

Even Helicopters

An uneventful night landing had been made and the pilot began taxiing to a ramp area through a narrow throat. The ramp was unlighted and there was no taxi director. So the pilot stopped and offloaded an aircrewman to act as taxi director.

The pilot, when directed, began taxiing slowly to avoid another aircraft parked on the small ramp. Near the center of the ramp, he began a 180-degree turn to position the helicopter facing the throat for departure. As the helo completed half a turn, the tail rotor blades and the horizontal stabilizer struck a hangar door. End of flight operations.

A Strange One

A *Skyhawk* was in the hangar undergoing maintenance. An F-4 transient pilot, unfamiliar with local taxi procedures came taxiing undirected through an unmarked area. As he turned to park, his exhaust entered the hangar and set off the sprinkler system. The disassembled *Skyhawk* was drenched.

***Corsair II* Doing Fine**

A pilot was ready to depart a civilian airport to return to Homeplate. The taxiway and parking ramp were being cleared after an 18-hour snowstorm. He taxied across the ramp toward a parked aircraft near his taxiway but stopped to confirm directions from the tower. He was advised to continue taxiing and that he was proceeding correctly. Still not satisfied, he queried the tower a second time. Again he was reassured he was doing fine.

After proceeding another 50 feet he taxied into a ditch covered by snow. The aircraft came to rest about 5 degrees nosedown and 10 degrees right wing down. His engine was quickly FODed by snow and dirt.

***Phantom* Strikes Again**

After landing at night, the F-4 pilot stopped short of the fuel pits to get his droptank pins installed before refueling. The plane captain, after inserting the pins, gave the pilot a come-ahead signal and passed taxi control to a director in the pits. The director waved him ahead but the *Phantom's* port gear left the pavement and sank into the mud.

Which Way?

Two pilots in a T-2 made a service stop away from Homeplate at night. Neither was familiar with the airport. When ready to taxi, the tower was advised of their unfamiliarity with the field. The tower "assumed control." Instructions were issued, and the pilot discovered he was taxiing between two rows of parked aircraft. He stopped, informed ground control and was directed to continue.

After passing safely between the rows of parked aircraft and seeing no taxi lights the pilot stopped again. Ground control advised him to taxi straight ahead. He complied and taxied off the concrete mat. Quite some time later the aircraft was lifted by crane back onto the concrete after several attempts to tow it had failed.

Set the Record Straight

Who's the guy who gets the blame?
Who's the one with besmirched name?
Who obeyed the director's flag?

Who dinged the bird? Oh my! Egad!
The pilot.

Who taxied into a darkened ramp?
Who parked off spot, the careless scamp?
Who the jagged tiptank made?
Who hit the hangar with rotor blade?
THE pilot.

Who turned on the sprinkler flow?
Who ended up nosedown in snow?
Who off the concrete ran? NITWIT!
Who didn't reach the fuel pit?
THE PILOT.

Contributory Causes

There is probably no airport in existence where booby traps don't lie in wait for an unwary pilot. New airports, old airports – they're all the same. If the trap is not in the lighting system it's probably in the airport markings, or the kind of surface, or in stabilization. If none of these are factors, it could be the tower instructions issued, but not understood.

Each of the ground accidents and incidents used to illustrate this article contained comments which bear out the point about booby traps. Some of these were:

- "The lighting in the fuel pits has been a problem for some time. It has been reported and is known by airfield operations. Temporary lighting will be used for all night operations until normal lighting is repaired."
- "Taxi and line areas should be well marked and provide no possibility for pilot confusion."
- "Both . . . pilots failed to exercise the same precautions which are routine to taxi operations at homebase – stationing a wingwalker between the rotor tip path and the hangar."
- "The aircraft was parked during the night 2 days prior to this incident. At the time it was chocked, only one other aircraft was beside it. There were no spotting marks in the parking area."
- "The policy of placing flare pots at closed intersections will be resumed to ensure that pilots are able to identify existing taxi routes. It is recommended that white centerline lights be installed on all taxiways."
- ". . . lack of perimeter lighting of the mat boundary presents a definite hazard for night operations by pilots not familiar with the field. The placement of the first taxi light well into the taxiway can afford an erroneous visual presentation. No comment is necessary as to the controller's attempt to direct taxi of an aircraft he could not see."

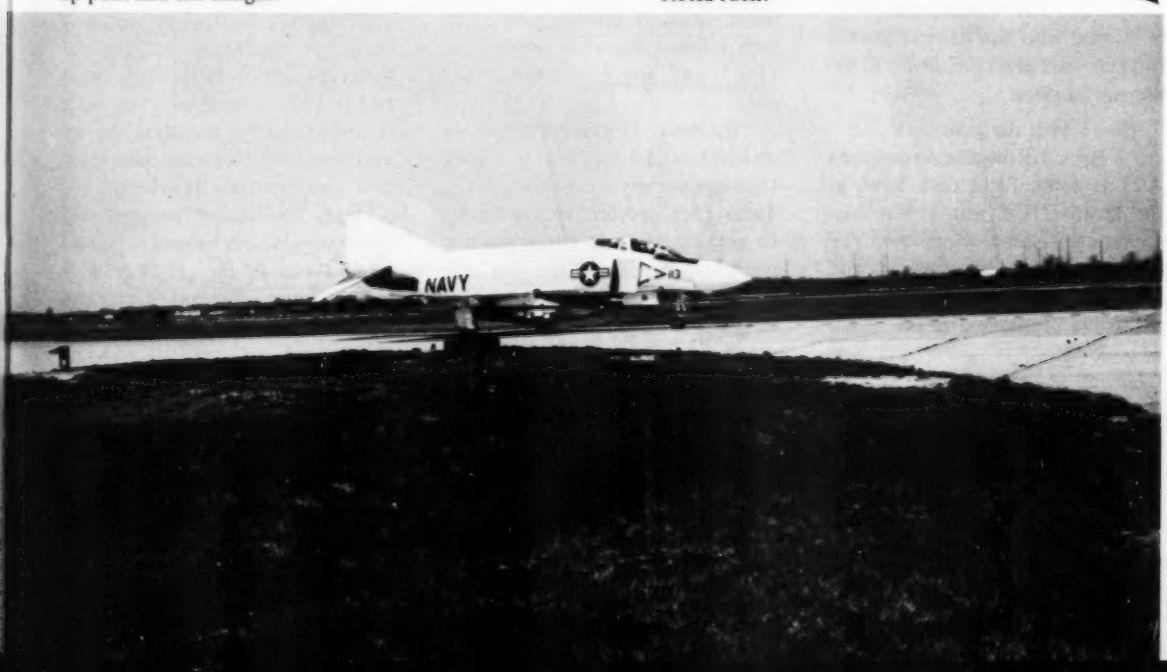
Summary

Most investigations of ground accidents recognize that circumstances, weather, obstructions, bum dope (the whole schmear) were instrumental in the mishap – to some degree. However, old numero uno–pilotsan, is Mr. Responsible.

So check your twelve, your three, your nine, even your six (you're still not guaranteed you'll clear everything).

You can, by golly, help yourself by using your landing lights or taxi lights to light the way. You can ask for a Follow-Me truck if one does not come to meet you OR if you want to be led out. You can check your compass while taxiing to ensure it reads north if you're supposed to be taxiing northbound. You can even stop. 'Tis better to be cussed by a controller than discussed around a long, green table.

Rotsa ruck!



Hearing protection is essential in hazardous noise areas. A member of the staff of the Aerospace Physiology Training Unit at NAS Lemoore puts the Navy's new *hazardous-noise-area* warning sign on a piece of yellow equipment.

Plan Ahead

WHEN you preplan your bailout or ejection, don't forget to preplan your actions during parachute descent and after touchdown.

A pilot who had to eject after a catapult shot gives this advice in his survival narrative.

Here's what the pilot says:

"I ejected from the aircraft (an A-7) at about flight deck level, in the Escapac 1C-2 seat, at less than 150 knots airspeed, wings level. The ejection sequence was very fast and automatic . . .

"While descending in the chute, I took off one glove and was removing the other when I entered the water.

"The wind kept the chute inflated and dragged me, with my head and shoulders well out of the water, toward the carrier. I pulled a riser, and the chute collapsed.

"Then I went underwater . . . I inflated the right side of my LPA-1, then surfaced and took my mask off. I grabbed a breath before going under again. I released one riser, then inflated the other side of my LPA-1 and got rid of the other riser.

"By now I was entangled in shroudlines and was having a hard time keeping my head above water. Twice I reached for the seat handle to get the raft out but could not reach it. I released the lap belt fittings and my oxygen hose because it was strung under my survival vest and was keeping me attached to the seat pan."

(The accident investigation board recommended that pilots check the routing of their oxygen hose assemblies. The hose should be outside all clothing and survival gear. – Ed.)

"I was then able to concentrate on breathing and untangling the shroudlines. I was alongside the carrier, almost under the flight deck overhang, and the water was very choppy. I was swallowing lots of water. I wanted very much to get hold of a lifering. People on the sponsons were throwing liferings, but they weren't quite reaching me. I gave them a thumbs up so they wouldn't waste any more rings. Soon I was clear of my shroudlines and the ship.

"The helo was waiting for me. I was able to lie back and relax.

"A swimmer was lowered into the water. I did nothing except tell him I was OK. He hooked us both to the hoist, and up we went. I was expecting lots of rotor wash from the helo but didn't notice any. Until I was in the helo, I kept my helmet on and visor down. My only injuries were a few bruises, some riser burns and a three-inch scratch.

"I would like to digress some and make further comments.

"First, my decision to eject was based on previously thought-out limits of flight performance I would accept after a catapult shot. As a consequence, my reaction to an unsatisfactory situation was easy and automatic. However, my planning had ended there – *I had never thought out what I would do while I was in the chute or after water entry.* Because of this oversight I was somewhat disorganized once in the water. I was in a state of panic for a few seconds wondering if I'd ever get a breath of air.

"I had a great opportunity to get rid of the chute while it was still full of air, but all I thought of was

notes from your flight surgeon

getting it collapsed so that I wouldn't get any closer to the ship.

"Somewhere in the sequence I bit my tongue so that it was bleeding profusely. I was spitting out water which looked quite red. This made me think I was hurt.

"Once I quit kicking and flailing at the shroudlines, I found that only four were attached to me. They were very easy to remove one at a time.

"I remember seeing the helo and wanting a swimmer in the water very much, but I was aware at the time that the ship was too close for any approach by the helo.

"My feeling of relief and happiness at being alive after being picked up is something indescribable. I will remember it for a long, long time!"

Among the recommendations made by the board was that commands should reemphasize not only the ejection decision and ejection procedure phase but the parachute descent and rescue phases as well.

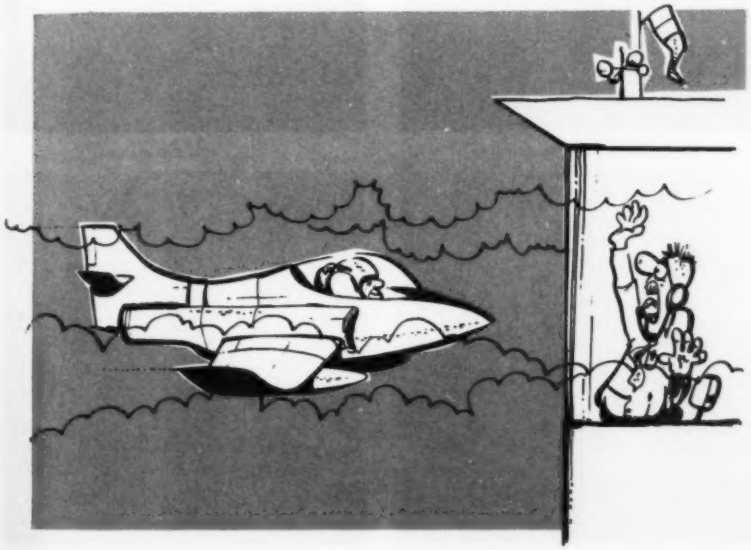
"This pilot was fully prepared for a catapult incident," the accident report states. "But, by his own admission, he had not thought out and rehearsed the in-harness and post-water entry phase of the event.

"Thus, he had to rely on his intellect vice conditioned instincts in a dynamic and stressful situation where reliance upon intellect could be unreliable at best and, in the presence of panic, fatal."

The squadron CO strongly concurred with this recommendation.

"Prior to his next flight, while suspended in harness in a simulated parachute descent, each pilot will receive a thorough reindoctrination in the aircraft seat and survival equipment. This will include (1) full flight gear inspection and (2) blindfold examination of the location of essential fittings, straps and equipment."

As one of the endorsers to the investigation report states, "Most of us can learn a valuable lesson from this pilot's experience."



'I have you in visual contact!'

Down With Mouse Ears

AN AO1 who armed a *Sparrow* missile which misfired in a static firing test may have permanent hearing damage. When he pulled the arming pin, the missile ignited and launched from the rack. (We won't go into the various procedural deficiencies and errors uncovered by investigators.) He was also burned on his face, arms, and hands.

When the accident occurred, he was wearing his Mickey Mouse ears pushed up over his temples instead of down where they belonged.

"We don't know if properly worn ear defenders would have completely protected his hearing," the investigating flight surgeon states, "but they certainly would have helped."

Hearing Damage

SIX cases of nerve-loss deafness attributable to noise damage were diagnosed at sick call in a single cruise, a carrier's safety council reports. These persons will never have complete hearing again. The council proposes two solutions: 1) strict enforcement of regulations on wearing individual ear protectors and 2) insurance that supplies of Mickey Mouse noise suppressors are adequate. ◄

1. SIGNALS AND SIGNALING

vital visual communications

IN many situations the use of verbal or audible means of communications is neither practical nor possible. Too much misunderstanding could occur, e.g., near aircraft with engines operating. To allow for required communications under such conditions, visual signals were developed. Visual signals work fine, as long as each signal has the *same meaning* to all who use it. This is especially important between pilots and shore or ship-based aircraft directors, where a misunderstood signal could result in a mishap.

The Armed Forces of the United States and its NATO Allies have recently completed an intense, indepth review of aircraft handling signals. Impetus to resolve signal differences was brought about as a result of a near

APPENDIX B
General Aircraft Handling Signals:

illus 38-40

B-3 – Proceed to next marshaler

B-4 – This way

B-8 – Move ahead

B-23 – Slow down engine(s) on indicated side

B-42 – Tiller bar/steering arm in place

C-1 – Landing direction

accident involving a U.S. helicopter and a ship belonging to a NATO nation. This review saw the compilation of a standardized set of aircraft handling signals applicable to all countries concerned. These and other aircraft handling signals are currently being incorporated into the latest revision to NWP-41, the official reference for such signals.

Revision (D) to NWP-41 is not yet available to the Fleet, but all indications are that it will be printed in the very near future. An advance copy of these new and revised signals has been made available to the Naval Safety Center and is the reference for the signals in this article.

The added or revised signals are shown as they will appear in Appendixes B, C, and D of NWP-41(D). These signals have been staged for clarity of execution.

The signals applicable to helicopter operations have already been promulgated in NWP-42. *All other signals shown are not to be implemented until NWP-41(D) has been distributed.* Once NWP-41(D) is received, each command should review *all* aircraft handling signals as to meaning, application, and proper execution.

B-9 – Stop

B-14 – Clearance to approach aircraft

B-15 – Personnel approaching the aircraft

C-2 – Move upward

C-4 – Move downward

C-5 – Move to left

C-6 – Move to right

C-19 – Cut cable

C-20 – Spread pylon

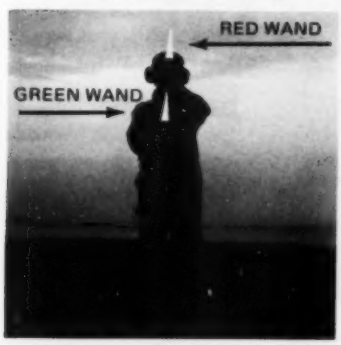
C-21 – Fold pylon

C-22 – I desire HIFR

C-23 – Commence fueling

C-24 – Am pumping fuel

C-25 – Cease fueling



C-26 – Have ceased pumping fuel

C-27 – Desire to move over deck and return hose

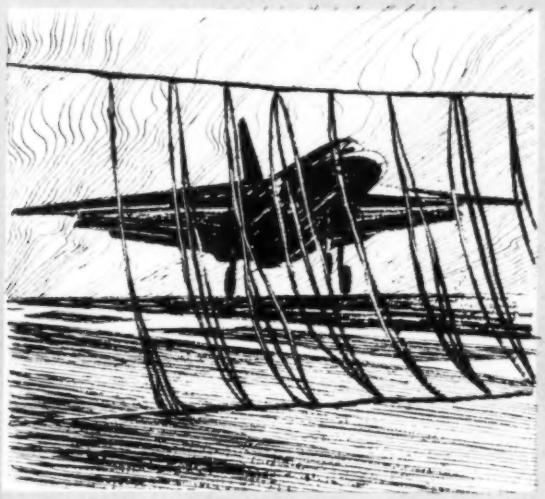
C-28 – Execute emergency breakaway

D-12 – Buffer aft

The March APPROACH saluted CDR Harry Klein with a Bravo Zulu for professionalism in executing a night single-engine approach to a barricade engagement in an RA-5C.

Since his overall record is one of consistent and conspicuous professionalism, COMNAVSAFECEN asked him for some comments on his personal safety philosophy. Reprinted here is his thoughtful reply. – Ed.

SOME THOUGHTS FROM A PRO



"IN response to your request for a commentary, I have attempted in the paragraphs that follow, to put together a few ideas that comprise what might be termed a personal safety philosophy.

"These ideas are not original. They are, instead, time-worn and proven axioms that through personal experience, error, and maturing judgment, have developed special significance in my personal game plan for safety.

"First, allow me to disclaim any special qualifications in aviation safety. On the contrary, I have always tried to remain aware of the fact that I am just as likely to become involved in an accident as the next man. To me, carrier aviation is somewhat akin to poker.

"A skillful player can reduce the risk, but he can never fully control the fall of the cards. I consider this a realistic rather than fatalistic view. In order to deal with uncertainty, you must first acknowledge its presence. Understanding the odds is a prerequisite in any decision process. A rational man does not bet against himself, yet the accident statistics are full of aviators who came to grief while flying around in marginal weather, with marginal aircraft, for marginal reasons.

"We all take chances; it is part of the job, but the payoff has to match the odds or you are bound to be a loser.

"Having a winner's attitude is not enough. You have to know the odds of drawing two for a possible straight. To the aviator this means studying the total environment he will be operating in. He must know his aircraft; not just the emergency procedures, but every system, every flight characteristic, every recent maintenance action.

"He must know the terrain, the weather, the traffic density and the flak environment. He must know the ship or field he operates from – the abort gear, the slope of the runway, the slick spot by the No. 3 cat, that the LSO is using MOVLAS, and there is a slight starboard crosswind. He must know and understand all the rules of the game.

"Yet, all that knowledge is still not enough. He has to play the hand he is dealt. This is where the game gets personal between the pilot and his aircraft. There are many ways he can improve the way he plays: concentration, practice and confidence. There are many ways he can lose the hand, too: get lazy, rationalize, stop thinking, and start reacting. Apprehension is an enemy too, especially in a tight spot. It has to be understood, recognized, and controlled.

"It all adds up to the professional approach; what it takes to win in any contest."

Very respectfully,
CDR H. L. Klein, USN

YOU, the Supervisor: Key to Safety

A UNIT's safety program cannot be successful without the active participation of the supervisor. There is no principle more thoroughly proven; the supervisor is the key man in the safety of any operation. A dedicated and conscientious supervisor is always aware of his duty to keep men under his direction safe from hazards and injury.

illus 42-43

1. SUPERVISION
2. SAFETY PROGRAMS

How can you, as a supervisor, be most effective in maintaining safe conditions and promoting safe operations? First, you must know the details of your unit's safety program. You must know what your responsibilities are and how you expect to integrate them with safety. You must know your men and their qualifications. You must know the safe work methods for each operation and where you can obtain additional

information concerning them. Second, you must supervise for safety. Through planning, you must anticipate potential hazards and take corrective action.

You must encourage suggestions and request hazard reports from the men. It is imperative that you, as a supervisor, plan for safety just as you would for any other part of the operation. Third, you must ensure that a strong OJT program is in effect. Point by point demonstrations of the operations are often required. You must *tell* them, *show* them, and then *show* them again.

Fourth, you must instill the proper safety attitude in your men so that they will work safely even when you are not present. Briefings, counseling, and bulletin boards will help keep each man aware of safety. You should encourage group discussions of safety problems, allowing your men to actively participate in the safety program. Professional supervisors should learn all the angles of creating safety attitudes and use them continually. Remember, safety begins with the right frame of mind.

The unit safety officer's job is to plan the safety program and assist you as the supervisor in maintaining safe conditions and promoting safe operations. He can give you a great deal of information about accident prevention and explain the importance of the supervisor's role in the unit's safety program. The one thing the safety officer cannot do is take the safety instruction and safety supervision responsibilities from you. You must accept the full responsibility for safety in your section.

Listed here are 16 ways that you, as a supervisor, can put safety to work:

(1) Take the initiative in recommending ideas for safer equipment, tools and operations.

(2) Be professional when it comes to taking care of equipment and keeping it safe.

(3) Take charge of operations that are not routine to make certain that safety precautions are determined and observed.

(4) Know what materials are hazardous and how to handle them safely.

(5) Know what personal protective equipment is necessary and *ensure* that such equipment is used.

(6) Become an expert on waste disposal for good housekeeping and fire protection.

(7) Enforce good housekeeping.

(8) Be alert for the man who may be an unsafe worker.

(9) Continue to "talk safety" and impress safety on your men.

(10) Establish good relations with the unit's safety committees.

(11) Set the example for safety.

(12) Use judgment in criticizing or praising, and know the value of public praise.

(13) Not only explain how to do a job, but show how, and *observe to ensure it continues to be done safely.*

(14) Study the seemingly unimportant accidents and *take corrective measures.*

(15) Keep the men informed of the safety policy.

(16) Through counseling, keep abreast of personal problems your men may be having and, showing concern, work effectively toward a solution.

By following these guidelines, you will promote greater understanding and a higher degree of safety within your unit.

Courtesy First MAW, *The Professional*

Bravo Zulu

AS scheduled, LT Charles E. Brown, VA-46, launched on a routine mission from the USS KENNEDY in an A-7B *Corsair II*. The aircraft had recently completed a calendar inspection, followed by a 1.9 hour test flight.

After being airborne for about 1 hour on this flight (the second flight since the calendar inspection), LT Brown noticed that the PCL (power control lever) had no effect on RPM below 80 percent. A gentle climb was begun and power advanced to 85 percent to return overhead the CVA.

The APC was engaged in an attempt to control the power but the PCL and RPM remained unchanged. A climb was begun to conserve fuel. Upon reaching optimum altitude, max endurance airspeed was maintained.

Overhead the carrier at FL 280, the PC-2 began fluctuating, then dropped to zero. The aircraft was diverted, in company with a wingman, to Souda Bay, Crete, about 85 miles away.

While descending, the power gradually increased until, at FL 200, the power was at MRT and could not be reduced by retarding the PCL. Landing gear and flaps were extended by emergency means following a zoom climb to reduce airspeed. A gradual descent was then made in a "dirty" configuration.

Divert field weather was forecast as 1500-foot scattered, 3000 overcast, 3 miles visibility in rain. Actual weather was 600-foot overcast, tops at 10,000 with 1½ miles visibility in rain and light, patchy fog.

Approach control could not provide radar services or paint an IFF emergency squawk. LT Brown had lost his TACAN and radar altimeter; and the A-7's search radar was inoperative. A modified overwater approach (because of mountainous terrain) was flown, using his wingman's TACAN. Fuel on final was 1000 lbs.

A level TACAN approach to a downwind entry was planned, however, the approach end of the duty runway was obscured in a heavy rain squall, making a visual approach impossible. With the downwind end in sight, a straight-in was decided upon. With no speed brake to control airspeed (recommended by NATOPS), he secured the engine at 260 knots 1½ miles out.

Landing configuration was gear, hook and flaps down, with the EPP extended (switch in "land" position to maintain radios and angle-of-attack).

Touchdown was 2000 feet down the runway, on speed. Maximum aerodynamic braking was used and wheel braking commenced at 80 knots. The *Corsair II* stopped after 4300 feet of roll-out.

LT Brown had experienced several equipment failures under the most trying of circumstances. By his professional display of flying skill in coping with such a compound emergency, he succeeded in saving a valuable naval aircraft. Well done! ◄

LT Charles E. Brown, VA-46

The Constellation Centaurus.

Letters
to the Editor

Food for thought gives some people indigestion.

Ace L.

Wants "Quick Fix"

FPO, San Francisco – While it is appreciated that the "quick fix" is not the most desirable of solutions to aircraft mechanical discrepancies, situations exist wherein the "quick fix" is the best course of action.

The article entitled "Bravo Zulu" in the February 1972 APPROACH describes the difficulties of coping with an F-4B with the not too uncommon "failed bleed air duct."

Although hydrostatic testing and some redesign of the ducting has improved the reliability of the bleed air system, it is still a potentially hazardous system. The need to "deactivate" the system due to failure of bleed valve linkages in the wing, battle damage, or metal fatigue of ducting could be accomplished by adding two valves, one at each engine bleed air outlet.

Physical space limitations make this installation difficult, but an alternative would be to add ducting and a valve of sufficient size to vent the system to the atmosphere to reduce system pressure to a very low value. Either system would remove the hazard that the high temperature, high pressure bleed air presents. These valves, actuated by mechanical linkages from the cockpit, would assure the aircrew positive control of a potentially hazardous system.

CDR G.C. Groehn
Staff CINCPAC

• Such a suggestion could be of value provided space was available for installation of a vent system. However, AFC 440 (dated 2-12-71) installs a bleed air shutoff valve near the source of bleed air.

This change is to be installed not later than the next PAR or overhaul. The F-4 PAR cycle is presently 24 months, and likely the change will be installed in all aircraft within a year. This AFC should solve the problem.

Frustrated

FPO, New York – Recently our squadron received orders on a replacement for our *only* AME. On checking the incoming man's record, we determined that he had no training on the ejection seat we use in our aircraft – in fact had never worked on *any* seat before, and he was to be our *only* seat man. A call to the appropriate detailer revealed that they were aware of his deficiency, but that there were no funds to train him. While considering this deplorable but unfortunately typical absurdity, I read a Weekly Summary which noted that a pilot, flying the same type aircraft we fly, had been killed when his seat wouldn't fire. It was not connected properly to the face curtain. Now most detailers and office types don't consider their jobs as being closely related to aviation safety – at least not like the wrench twisters. Yet the detailer who sent us an untrained AME, and refused to school him prior to arrival, was playing with expensive machines and pilots' lives. It is sobering to realize that this command was set up for an occurrence as tragic as the one reported in the Weekly Summary, by the actions of a far-removed personnel detailing office. The paper palace people must be made to realize that the impact of their actions are far-reaching, and occasionally devastating. There can be no budget on safety.

Unsigned

APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request.

Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, Va. 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

• Unfortunately there is a shortage of qualified personnel and budget limitations severely hamper training at various levels of the Navy establishment. No personnel detailer has ever assigned a man to an activity with the intention of "playing with expensive machines and pilot lives." When the choice comes down to an activity receiving either an untrained, unqualified man or no man at all, most will gladly accept the former. It is then incumbent upon the command to train and supervise the unqualified to their best advantage.

It is not too difficult to feel the frustration expressed in your letter as to the relationship between personnel-caused mishaps and lack of fully qualified technicians to work on and maintain today's complex weapon systems. However, the absurdity of the situation is not that it exists, but that some feel there is no solution to the problem.

Needs Exposure

FPO, San Francisco – Fuel hoses, cables and various equipment used to service aircraft are left laying in the catwalks after flight ops have been secured. This is particularly dangerous to maintenance crews working at night. This problem probably exists on all carriers and can only be corrected by enforcing good housekeeping procedures. Having the equipment scattered around is bad enough during flight ops, but after secure it is unforgivable!

Greenshirt

• Before getting into a reply, we'd like to quote part of the endorsement which your squadron aviation safety officer put on your report. He wrote:

"This problem seems to grow worse all the time. Reminding the divisions concerned has not helped. Hopefully, a little exposure in your safety

publications could bring this situation closer to a solution."

Well, here's the exposure – let's see if it expedites a solution. The problem you mention is a continual hazard to personnel having to use catwalks day or night. Although provisions have been built-in to receive and stow all the gear you have mentioned, it seems much easier for many to just drop it in the catwalk.

Until air wing and ships company make an effort to get behind a program to eliminate carelessness and neglect, this problem is likely to remain *underfoot*. There is no reason why a little attention to good housekeeping can't get a big boost from CAG and the CO if the subject is brought up at the next ship's safety council meeting.

Flight Deck Ankle Injuries

FPO, San Francisco – There have been numerous occasions on the flight deck of CORAL SEA in which people have incurred ankle injuries, thus preventing them from performing their duties to the fullest. One squadron linecrew has had five such incidents that I know of. Most of these are caused by the condition of the flight deck, usually when it's wet and slick.

To prevent such accidents, I suggest that people working on the flight deck be issued high-top boots. Flight boots are the most readily available. This would provide more ankle support.

Unsigned

• A computer run of all injury reports from January 1969 to January 1971 showed that only one man involved in a flight deck accident would have been helped by high-top shoes. (He lost his footing on the deck while working on an aircraft and sprained his ankle.)

Our records do not substantiate the need for high-top boots on the flight deck. This does not necessarily mean that accidents such as you describe are not occurring. It may simply mean that they are not being reported.

Welcome Words

Richmond, Va. – I am a civilian flight instructor flying, for the most part, light training aircraft, and an avid reader of APPROACH to which I subscribed about a year ago. My only contact with F-4s, A-4s, etc., is as a spectator, however, I find that an overwhelming majority of the articles in your excellent magazine can be applied to any flight environment, whether military or civilian. I feel that APPROACH should be read by *all* pilots who have an interest in aviation safety beyond the "hangar flying" stage.

Keep up the good work.

David M. Reid, CFI 1644175
413 N. Davis Avenue

• Those are welcome words, indeed, Dave. Thanks.

Kingfisher Cover

Washington, D.C. – Your article in the March 1972 issue on the OS2U *Kingfisher* brought back memories of that historic first attack on Truk on 16-17 February 1944. I want to comment regarding the picture at the bottom of the second page. That was no ordinary or routine recovery! The lad in the back seat is Lieutenant George M. Blair of VF-9 who, only a few hours earlier, had been shot down right in Truk lagoon while on a strafing mission. That gutsy little *Kingfisher* and her courageous crew, Lieutenant Denver F. Baxter and Radioman Reuben F. Hickman, braved hostile fire and an uncertain fuel supply to pick big George out of the water and return him safely to USS BOSTON (I think) from whence he made his way back to ESSEX. I was told that Lieutenant Denver had about one pint of gas remaining when he hooked onto the crane.

K. C. Childers, Jr.
Rear Admiral, U.S. Navy

• Response to the *Kingfisher* article has been extremely gratifying. No doubt it stirred memories of near forgotten missions for many vintage Navy pilots.

It is encouraging to note that even contemporary naval aviators display avid interest in such historical articles. With a heritage as rich as that of Naval Aviation – it's only natural.

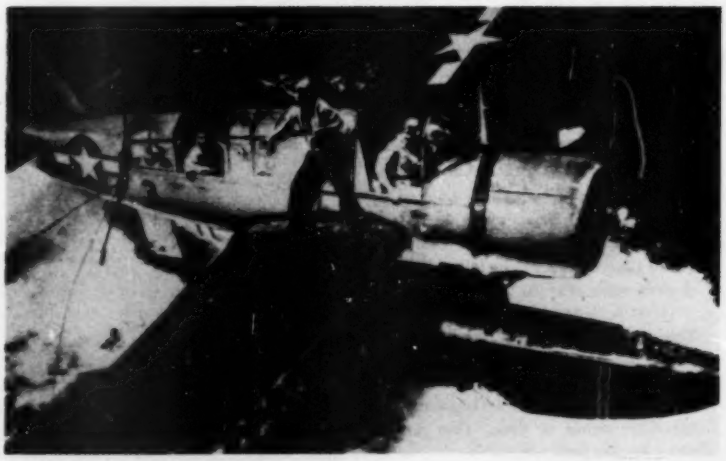
APPROACH intends to temper the safety message occasionally with such articles in recognition of the significant contributions made over the years by the men and machines of our flying Navy.

First Aid Kits in P-3

FPO, San Francisco – The September 1971 *General Crossfeed*, survival section, states that BUMEDINST 6780.1E indicates that patrol aircraft should have a minimum of three first aid kits in the aircraft and that there should be one kit for every three crewmembers and passengers and/or compartment. On the other hand, the P-3 NATOPS flight manual (NAVAIR 01-75PAA-1), page 1-133, indicates that two first aid kits are to be carried in the aircraft.

A recommended change to the NATOPS manual was submitted to place five first aid kits in the P-3 to provide sufficient kits for a complete flight crew as a minimum. The annual P-3 NATOPS conference, where all such changes are considered, was recently concluded, and it has been learned that the recommendation was not accepted. It was said that two kits should be sufficient.

I do not believe this to be the case . . . First aid kits carried in liferafts are not readily available and, in my opinion, do not satisfy the requirement for the



FLIP Changes

THE Department of Air Force, Headquarters Aeronautical Chart and Information Center, St. Louis, Missouri has notified the Naval Safety Center of the following changes to FLIP documents:

- *Visual Approach:* Visual approach has been redefined as follows: An approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of a radar facility and having an air traffic control authorization, may deviate from the prescribed instrument approach procedure and proceed to the airport of destination by visual reference to the surface.
- *Identification of Heavy Jets:* When the allowable gross takeoff weight of the aircraft is 300,000 pounds or more, enter the symbol "H/" as a prefix to the type aircraft designator in item 5 of the DD-175. Examples: H/C-141, H/C-5.

number of kits required – one for every three men.

LCDR Robert D. Nedry, USN
ASO, VP-1

● As a result of your letter we queried BuMed on this. We learned that BUMEDINST 6780.1G, "Aircraft First Aid Kits," is now in print (6780.1F was the same as 6780.1E on P-3 first aid kits) and should be distributed shortly. This revised instruction authorizes two first aid kits per P-3 aircraft in line with the NATOPS flight manual. Our only suggestion would be: enlist more advocates to your cause and have the matter included on the agenda for next year's P-3 NATOPS conference.

VP-22 "Shoots" Pacific Airfields

NAS Barbers Point, Hawaii – Coming into an unfamiliar airfield in the Pacific is a thing of the past now that Patrol Squadron TWENTY-TWO has completed filming actual approaches and landings at various airfields.

These 16mm Cinemascope movies were shot by VP-22 during a 16 day sojourn to NAS Barbers Point; NAS Agana, Guam, Cubi Point, Republic of the Philippines; Hong Kong International; Utapao, Thailand; NAF Naha and NAF Futima, Okinawa; MCAS Iwakuni, NAS Atsugi and Misawa AFB, Japan.

Prior to this film, a pilot flying into these unfamiliar fields was unaware of many of the hazards and obstructions characteristic of the surrounding area.

Complete IFR, GCA, circular and missed approaches are now available on film with surrounding topography for these airfields.

Unsigned

● Sounds like a good idea to those of us here at APPROACH. Matter of fact – why hasn't someone thought of this before?

Oversized Fighter Pilot

FPO, New York – In regard to your comment in the March 1972 issue of APPROACH in response to reader comments about "Ghostrider in the Sky," I take exception to your veiled allegation that "East Coast comrades" do not peruse APPROACH as thoroughly as others. Interpreting "East Coast" to mean NAVAIRLANT, as I am in fact a West Coast (of Spain) type, I wish to report that I noted the apparition upon first reading that excellent issue. I noticed that the proportion of the "head" in relation to the size of the canopy of the "Lead Sled" would indicate that he was either suffering from hydrocephalus or was about nine feet tall. This would indicate that the "face" belonged to a person who would not be physically qualified to fly, even in a *Phantom* which was indicated by the circled figure on page 47 of the March issue.

LCDR Gordon A. Jobe, USN
VQ-2

● Well said! Nowhere among the many accusations directed at the "ghostrider" was there any mention of the proportionate size his attached body would have to manifest.

Indeed such an individual would have dwarfed Wilt Chamberlain. And even for a fighter pilot, that's somewhat beyond the gap of credibility.

Congratulations on *your* keen observation of veiled allegations. And thanks for your faith in APPROACH.

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One cool judgment is worth a thousand hasty councils. The thing to do is to supply light and not heat.

Woodrow Wilson

Vol. 17 **approach** No. 12

RADM W. S. Nelson
Commander, Naval Safety Center
Publisher

Our product is safety, our process is education and our profit is measured in the preservation of lives and equipment and increased mission readiness.

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NavAir 00-75-510

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Credits

Although the Douglas A-1 *Skyraider* no longer flies as a Navy bird, it is used extensively by both U. S. Air Force and South Vietnamese pilots in Southeast Asia. The cover, by R. G. Smith of McDonnell Douglas Corporation, is from the original painting now hanging in the "O" Club at NAS Lemoore. It pays homage to a real workhorse – *still working.* **Pg 20, 33-34** APPROACH diagrams by Don Lips. **Pg 38-40** Photos by PH2 Norden. **Back Cover** A well-executed emergency landing by LT W. W. McKenzie of VT-3.

From My Point of View

Safety "Ombudsman"?

A fighter skipper, talking to an APPROACH reporter recently, cited the lack of horizontal communication in safety matters. According to him, there is a plethora of vertical communication up and down the chain but too little crosstalk – squadron to squadron and aviator to aviator.

I share his view and think aviation safety can profit handsomely by increasing the exchange of ideas between professional peers.

Ergo, in recent months we have substantially increased the number of Anymouse reports, letters, and contributor articles in APPROACH. In the May issue there are four pages of letters in contrast to the usual two; and of late six feature articles received from the field have drawn widespread interest and praise.

We are vitally interested in your problems out there in the hustings. APPROACH is your forum, and in some respects I am your "Ombudsman". Let's hear from you!

Round and round

Statistics can be made to prove almost anything, and a recent study of stall/spin phenomena illustrates the point. Since 1962, the only factor identifiable as common to successful spin recovery in the F-4 is ejection of the RIO. Based on this information, one could be statistically facetious and conclude that the only way to recover from a spin in the *Phantom* is to *eject the RIO.* This could get pretty tiresome for the back-seat riders if spin/departure training were approved for the CRAW.

This bit of whimsy recalls the real reason for the study – SAFECEN's input to the spirited, ongoing discussion of the pros and cons of giving training in recovery from departed flight in the A-7. Without debating that issue here, suffice to say that there isn't a nice obvious, easy answer, and any decision in the premises now isn't necessarily the final word. Further discussion is inevitable and ought to inject a little "hate" in Happy Hours around Lemoore and Cecil.

"Throw a nickel on the grass·····"

In case you missed CDR Harry Klein's wonderful analogy between poker and naval aviation (p. 41), I recommend you go back and read it. The medicine goes down easy, and it might just win you a pot in a game where the stakes are real high – like an F-14 – or maybe "forever".

W. S. NELSON

MID-YEAR SAFETY STANDDOWN

Safety standdowns are extremely effective in increasing safety awareness among all hands. Does your command intend to observe a mid-year safety standdown in July? If so, now is the time to plan in detail so as to realize the maximum benefit.